SIEMENS

SIMATIC NET

Introduction to the CP 1613 for Industrial Ethernet

Manual

This manual is part of the documentation package
with the order number:

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C79000-G8976-C136 Release 1

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Wir haben den Inhalt der Druckschrift auf Übereinstimmung mit der beschriebenen Hard- und Software geprüft. Dennoch können Abweichungen nicht ausgeschlossen werden, so daß wir für die vollständige Übereinstimmung keine Gewähr übernehmen. Die Angaben in der Druckschrift werden jedoch regelmäßig überprüft. Notwendige Korrekturen sind in den nachfolgenden Auflagen enthalten. Für Verbesserungsvorschläge sind wir dankbar. Technische Änderungen vorbehalten.

C79000-G8976-C136

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

C79000-G8976-C136

Nous avons vérifié la conformité du contenu du présent manuel avec le matériel et le logiciel qui y sont décrits. Or, des divergences n'étant pas exclues, nous ne pouvons pas nous porter garants pour la conformité intégrale. Si l'usage du manuel devait révéler des erreurs, nous en tiendrons compte et apporterons les corrections nécessaires dès la prochaine édition. Veuillez nous faire part de vos suggestions.

Nous nous réservons le droit de modifier les caractéristiques techniques.

C79000-G8976-C136

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SIMATIC NET

Introduction to the CP 1613 for Industrial Ethernet

Manual C79000-B8976-C128/1

Note

We would point out that the contents of this product documentation shall not become a part of or modify any prior or existing agreement, commitment or legal relationship. The Purchase Agreement contains the complete and exclusive obligations of Siemens. Any statements contained in this documentation do not create new warranties or restrict the existing warranty.

We would further point out that, for reasons of clarity, these operating instructions cannot deal with every possible problem arising from the use of this device. Should you require further information or if any special problems arise which are not sufficiently dealt with in the operating instructions, please contact your local Siemens representative.

General

This device is operated by electricity. In operation, certain parts of this device carry a dangerously high voltage.

WARNING !

!

Failure to heed warnings may result in serious physical injury and/or material damage.

Only appropriately qualified personnel may operate this equipment or work in its vicinity. Personnel must be thoroughly familiar with all warnings and maintenance measures in accordance with these operating instructions.

Correct and safe operation of this equipment requires proper transport, storage and assembly as well as careful operator control and maintenance.

Personnel qualification requirements

Qualified personnel as referred to in the operating instructions or in the warning notes are defined as persons who are familiar with the installation, assembly, startup and operation of this product and who possess the relevant qualifications for their work, e.g.:

- Training in or authorization for connecting up, grounding or labeling circuits and devices or systems in accordance with current standards in safety technology;
- Training in or authorization for the maintenance and use of suitable safety equipment in accordance with current standards in safety technology;
- First Aid qualification.

Contents

Notes for the Reader

Guide to the Documentation

The "Hardnet for Industrial Ethernet" manual consists of 6 volumes with the following titles:

- Volume 1
  "Introduction to the CP 1613 for Industrial Ethernet"
- Volume 2
  "SEND/RECEIVE Programming Interface"
- Volume 3
  "S7 Programming Interface"
- Volume 4
  "Configuring S7 Operation with COML S7"
- Volume 5
  "TF Programming Interface"
- Volume 6
  "Introduction to TF 1413" (particularly the Chapter "Configuring with COML TF")

Conventions

The following symbol is used in the text.

☞ **This symbol highlights special features or dangers.**

1 Introduction to the CP 1613 for Industrial Ethernet

The communications processor CP 1613 for Industrial Ethernet is used in SIMATIC programming devices (PGs), Personal Computer (PCs), and Workstations.

The CP 1613 supports both the ISO Transport protocol complying with ISO 8073 and the TCP/IP protocol with the RFC 1006 supplement. The user interface used remains unchanged.

This manual provides you with an overview of the following topics:

- Basic principles of communication.
- Required experience and guide to the documentation for each group of users.
- Introduction to the S7, TF and SEND/RECEIVE programming interfaces

1.1 The Communications Processor CP 1613 in Industrial Ethernet

Areas of Application

Using the communications processor CP 1613 for Industrial Ethernet, you can connect PGs, PCs, or workstations to the **Ethernet** communications network.

Operating Systems

The CP 1613 can be operated under Microsoft Windows NT Version 4.0 or higher with Service Pack 4.

Structure of the CP 1613

- The CP 1613 is plugged directly into the SIMATIC programming device, a PC, or a workstation and requires a PCI slot.
- The module can be attached to Ethernet using three different communications network cables:

Type of Communications Network Cable	Socket
Industrial **T**wisted **P**air - ITP	15-pin Sub D Female Connector, the switchover to ITP is made automatically after the computer has booted.
Attachment **U**nit **I**nterface - AUI (transceiver cable)	15-pin sub D female connector, the switchover to AUI is made automatically after the computer has booted.
Twisted Pair	RJ-45 female connector

- The data transmission rate (10/100 Mbps) is detected and set automatically.

Multiple network adapters

With a suitable software and hardware configuration, it is possible to operate more than one network adapter.

Software Packages

The CP 1613 is available with a comprehensive range of software products. These products are described in greater detail in the following chapters.

Functionality

Layers 1 to 4 of the appropriate SIMATIC NET protocol are used on the module. Data is exchanged between the module and host memory via a dual-port RAM. Data is exchanged between the host system and the CP 1613 by module drivers specific to the operating system.

1.2 Applications of the CP 1613

Areas of Application

The CP 1613 can be used for the following applications:

- For programming programmable logic controllers
- In industrial production
- In office networks

Example of Programming

With CP 1613, you can program SIMATIC programmable controllers via the "Industrial Ethernet" communication network or the program packages STEP 5/STEP 7.

Example of Use in Production

The CP 1613 provides the bases for communication for user programs with the following tasks:

- Acquisition and modification of machine statuses
- Maintenance of production statistics
- Archiving of process data
- Visualization of manufacturing and production processes

Various protocols are available.

Examples for Office Networks

Under Windows NT, the CP 1613 supports the following networks in the office area:

- TCP/IP via PC-NFS
- Novell Netware

Attachment to these networks is via NDIS. This means that applications in the office environment can be used universally for all networks with NDIS capability.

1.2.1 Programming SIMATIC Programmable Controllers Via the CP 1613

Programming >without< a CP 1613

User programs for the S5 and S7 programmable controllers are developed on a programming device or PC using the programs STEP 5 and STEP 7. **Without** a CP 1613 communications processor, the programming device or PC is connected **directly** to the programmable controller to be programmed.

Programming >with< a CP 1613

Along with the software package **PG 1613/Windows NT,** the **CP 1613** attached the programming device/PC to the "Industrial Ethernet" communications network and allows programming of SIMATIC S5 and S7 programmable controllers **via Industrial Ethernet**.

Functionality of PG 1613/ Windows NT

The **PG 1613/Windows NT** software package handles communications with the programmable controllers for the programs STEP 5 and STEP 7 via Industrial Ethernet.

1.2.2 The Communications Software of the CP 1613

Industrial Production

The CP 1613 is available with a comprehensive range of communications software packages.

The following packages are available for different applications:

- S7 Functions
- TF Protocol
- SEND/RECEIVE Interface
- Optional packages

S7 Functions

SIMATIC S7 system components communicate using the S7 functions.

To allow user programs on a programming device, PC, or on a workstation access to SIMATIC S7/M7 system components, the SAPI S7 programming interface was developed. Along with the necessary drivers, this is available in the software package **S7 1613/Windows NT** for Industrial Ethernet .

The SAPI S7 programming interface makes access to data on a SIMATIC S7/M7 programmable controller both simple and flexible.

The following services are available:

- Administrative services
- S7 Connection management services
- Variable services
- VFD services (**V**irtual **F**ield **D**evice)
- Trace and mini database services
- Field-oriented services
- Message services
- Diagnostic services for fault-tolerant connections

TF Protocol

User programs on the programming device, PC, or on a workstation use the technological functions via the TF programming interface.. This is available along with the required drivers in the software package **TF 1613/Windows NT** for Industrial Ethernet.

In terms of their functionality, the technological functions correspond to the international MMS services in compliance with ISO IS 9506.

The following services are available:

- Variable services
- Domain services
- Program invocation services
- VMS support services
- Environment and general management services

☞ **The TF protocol >cannot< be operated with RFC 1006.**

SEND/RECEIVE Interface

The SEND/RECEIVE interface based on layer 4 (ISO Transport or TCP/IP with RFC 1006) is used for communication between programming devices, PC, or workstations and SIMATIC S5/S7 PLCs.

User programs call the functions of the SEND/RECEIVE programming interface. This is available along with the required drivers in the software packages **PG 1613/Windows NT**, **S7 1613/Windows NT** and **TF 1613/Windows NT** as a DLL.

The SEND/RECEIVE programming interface has the following properties:

- SEND/RECEIVE is a simple C programming interface.
- SEND/RECEIVE provides access to S7 services on PCs and programming devices.
- SEND/RECEIVE is available as a C library and is used with Industrial Ethernet drivers and network adapters of SIMATIC NET for Industrial Ethernet.

Optional Packages

S7 and S/R-OPC Server for SIMATIC NET

The OPC server from SIMATIC NET provides Windows user programs with access to the products of SIMATIC NET for industrial communication.

To link your user program with the products of SIMATIC NET, you must use the open OPC interface. The interface to **S7 1613/Windows NT** is implemented by the OPC server for SIMATIC NET.

S7 or TF OLE/DDE Manager

For the S7 and TF interfaces, the appropriate product of the OLE/DDE manager can be used. With this product, OLE-compliant user programs such as MS Excel, MS Word or MS Visual Basic can be integrated in industrial communication.

1.3 Communication Options

Communication with SIMATIC S5

Communication with SIMATIC S5 is possible using the following program packages:

- STEP 5
- PG 1613/Windows NT for Industrial Ethernet
- S7 1613/Windows NT for Industrial Ethernet
- TF 1613/Windows NT for Industrial Ethernet

Communication with SIMATIC S7

Communication with SIMATIC S7 is possible using the following program packages:

- STEP 7
- PG 1613/Windows NT for Industrial Ethernet
- S7 1613/Windows NT for Industrial Ethernet

Diagnostic Tools for Industrial Ethernet

SIMATIC NET, SCOPE for Industrial Ethernet records all frames and is used for testing and troubleshooting when programming and installing systems.

2 Required Experience and Documentation

The communication software package of the CP 1613 for Industrial Ethernet is normally used by the following **user groups**:

- Users
- Installation personnel
- Programmers

Obviously, the different user groups need different experience and different documentation.

This chapter

- lists the required **experience** of the individual user groups
- provides a **guide to the documentation**.

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2.1 User Groups

Different User Groups

The various user groups of the software packages of the CP 1613 have different requirements in terms of experience. The information required by these user groups in the documentation is also different.

You should try, as far as possible, to identify with one of the user groups listed below. The following "Guide to the Documentation" will then help you to use the software packages of the CP 1613 efficiently.

We have defined the following user groups:

- Users
- Installation personnel
- Programmers

Who are Users?

Tasks of users:

- You use a specific user program. This communicates with partners via a CP 1613.
- The internal workings of the software package are not important for your **daily** work.

Who are Installation Personnel?

Tasks of installation personnel:

- You make parameter assignments and install software components to produce an executable user program.
- It is your job to adapt the communication software to the plant and system structure of your customer.

Who are Programmers?

Tasks of programmers:

- You write programs, ideally in the C programming language.

2.2 Users - Required Experience

What Experience Do You Require?

The following table shows the experience you require as a **user** of software packages of the CP 1613 for Industrial Ethernet:

IF you use the following software packages of the CP 1613...	**THEN you should be familiar with the following:**
PG 1613/Windows NT for Industrial Ethernet	• Handling PCs • Working with the SIMATIC S5/S7 systems
S7 1613/Windows NT for Industrial Ethernet	The structure of your user programs
TF 1613/Windows NT for Industrial Ethernet	The structure of your user programs

2.3 Users - Guide to the Documentation

Guide to the Documentation

The following table shows software packages of the CP 1613 for Industrial Ethernet and the relevant documentation for **users**:

IF you use the following software packages of the CP 1613 ...	**THEN please read the following documentation:**
PG 1613/Windows NT for Industrial Ethernet S7 1613/Windows NT for Industrial Ethernet	• README.TXT file (on the SIMATIC NET CD) • Product information • FAQ file (on the SIMATIC NET CD) • This volume, Chapter "Description of the Architecture" • Documentation of SIMATIC S5/S7 • If necessary the Installation Instructions
TF 1613/Windows NT for Industrial Ethernet	• README.TXT file (on the SIMATIC NET CD) • Product information • FAQ file (on the SIMATIC NET CD) • This volume, Chapter "Description of the Architecture" • Documentation of SIMATIC S5 • If necessary the Installation Instructions

2.4 Installation Personnel - Required Experience

What Experience do you Require?

The following table shows the experience you require as **installation personnel** for software packages of the CP 1613 for Industrial Ethernet:

IF you use the following software packages of the CP 1613...	**THEN you should be familiar with the following:**
PG 1613/Windows NT for Industrial Ethernet S7 1613/Windows NT for Industrial Ethernet	• Handling PCs • Working with the SIMATIC S5/S7 systems • Working with networks
TF 1613/Windows NT for Industrial Ethernet	• Handling PCs • Working with the SIMATIC S5 systems • Working with networks

2.5 Installation Personnel - Guide to the Documentation

Guide to the Documentation

The following table shows software packages of the CP 1613 for Industrial Ethernet and the relevant documentation for **installation personnel**:

IF you use the following software packages of the CP 1613...	**THEN please read the following documentation:**
PG 1613/Windows NT for Industrial Ethernet	• README.TXT file (on the SIMATIC NET CD) • Product information • FAQ file (on the SIMATIC NET CD) • Installation Instructions • Manual "Introduction to the CP 1613 for Industrial Ethernet" • If necessary, documentation for SCOPE Industrial Ethernet • SIMATIC documentation
S7 1613/Windows NT for Industrial Ethernet	• README.TXT file (on the SIMATIC NET CD) • Product information • FAQ file (on the SIMATIC NET CD) • Installation Instructions • Manual "Introduction to the CP 1613 for Industrial Ethernet" • For configuring communication, the manual "configuring S7 operation with COML S7" • If necessary, documentation for SCOPE Industrial Ethernet • Documentation of SIMATIC S5/S7
TF 1613/Windows NT for Industrial Ethernet	• Product information • Installation Instructions • Manual "Introduction to the CP 1613 for Industrial Ethernet" • For configuring communication, the manual "Introduction to TF 1613", Chapters 3 and 4 • If necessary, documentation for SCOPE Industrial Ethernet • Documentation of SIMATIC S5

2.6 Programmers - Required Experience

What Experience do You Require?

The following table shows the experience you require as a **programmer** of software packages of the CP 1613 for Industrial Ethernet:

IF you use the following software packages of the CP 1613...	**THEN you should be familiar with the following:**
PG 1613/Windows NT for Industrial Ethernet	• Handling PCs • Working with the SIMATIC S5/S7 systems • Working with networks
S7 1613/Windows NT for Industrial Ethernet	• Handling PCs • Handling the SIMATIC S5/S7 systems and progamming procedures • Working with networks • A programming language (ideally "C"). • Programming in Windows
TF 1613/Windows NT for Industrial Ethernet	• Handling PCs • Handling the SIMATIC S5 systems and progamming procedures • Working with networks • A programming language (ideally "C"). • Programming in Windows

2.7 Programmers - Guide to the Documentation

Guide to the Documentation The following table shows software packages of the CP 1613 for Industrial Ethernet and the relevant documentation for **programmers**:

IF you use the following software packages of the CP 1613...	**THEN please read the following documentation:**
PG 1613/Windows NT for Industrial Ethernet	• README.TXT file (on the SIMATIC NET CD) • Product information • FAQ file (on the SIMATIC NET CD) • Installation Instructions • Manual "Introduction to the CP 1613 for Industrial Ethernet" • Documentation of SIMATIC S5/S7
S7 1613/Windows NT for Industrial Ethernet	• README.TXT file (on the SIMATIC NET CD) • Product information • FAQ file (on the SIMATIC NET CD) • Installation Instructions • Manual "Introduction to the CP 1613 for Industrial Ethernet" • When using the S7 programming interface, the manual "S7 Programming Interface" • When using the SEND/RECEIVE programming interface, the manual SEND/RECEIVE Programming Interface" • Documentation of SIMATIC S5/S7
TF 1613/Windows NT for Industrial Ethernet	• README.TXT file (on the SIMATIC NET CD) • Product information • FAQ file (on the SIMATIC NET CD) • Installation Instructions • Manual "Introduction to the CP 1613 for Industrial Ethernet" • When using the TF programming interface, the manual "TF Programming Interface" • When using the SEND/RECEIVE programming interface, the manual "SEND/RECEIVE Programming Interface" • Documentation of SIMATIC S5

3 Description of the Architecture

This chapter describes the characteristics and functions of the software products of the CP 1613 Industrial Ethernet.

It provides you with basic information on the following topics:

- The reference model for communication, the ISO/OSI reference model
- Communications networks from Siemens
- Industrial Ethernet
- Software of the CP 1613 in the ISO/OSI reference model
- Interfaces of the software products of the CP 1613 for Industrial Ethernet

3.1 The ISO/OSI Reference Model

Smooth Interaction

As the user of powerful automation components such as host computers, field automation devices, printers, data servers etc. you require smooth interaction between these devices and control systems and can expect the following:

- Straightforward and simple use of your communications systems
- Openness and independence from specific device manufacturers
- Flexibility when modifying system structures without effecting the communication capabilities
- The highest degree of communication reliability
- Future-oriented investment : today's and tomorrow's devices will be able to communicate

Open Communication

The corner stone of open communication is a **heterogeneous** (open) **network** of automation components. Devices of different manufacturers and vendors can communicate openly with each other. (In contrast, in a **homogenous network**, only devices of one manufacturer are involved.)

The ISO/OSI Reference Model

The International Standards Organization (ISO) has defined a reference model for communication in open systems as the basis for open communication between devices of different manufacturers.

This ISO/OSI reference model (OSI - **O**pen **S**ystem **I**nterconnection) is the basis for standardization of communications techniques. It provides a framework for standardizing communications techniques in seven hierarchical layers.

Manufacturers of automation components or generally of DTEs, not only in the industrial field, base their development today on the ISO/OSI reference model.

The Seven Layers of ISO/OSI

The ISO/OSI reference model, the basis for open communication, is divided into 7 layers. The agreed procedures in the layers are known as protocols.

The following table lists the 7 layers, their names and functions.

Layer	Name	Function	Characteristics
7	Application layer	Application functions	Read/write Start/stop File transfer
6	Presentation layer	Data representation	Common language
5	Session layer	Synchronization of communication	Coordination of connections (establishment, termination)
4	Transport layer	Connection establishment / termination, confirmations, segmentation	Reliable transmission of information
3	Network layer	Addressing other networks /network connections	Communication between two networks
2	Data link layer	Access techniques, reliable transmission	CRC check, CSMA/CD, Token
1	Physical layer	Physical aspects of accessing the medium	Coaxial/triaxial cable, FO cable, Industrial Twisted Pair

3.2 SIMATIC NET Communications Networks

Areas of Application of SIMATIC NET

SIMATIC NET is an open, heterogeneous communication system with LANs (**L**ocal **A**rea **N**etwork) in different performance ranges for manufacturing and process automation in the industrial sector. It is based on national and international standards complying with the ISO/OSI reference model.

SIMATIC NET Communication Networks

To meet different requirements,SIMATIC NET provides the following communication networks:

- Industrial Ethernet (previously SINEC H1), a communications network for the area and cell network on the basis of IEEE 802.3.
- PROFIBUS - **P**rocess **F**ield **B**us (previously SINEC L2), the international standard for the field area for fewer nodes based on DIN 19245, Parts 1, 2 and 3.
- AS-Interface - **A**ctuator-**S**ensor **I**nterface (previously SINEC S1), a communications network for actuators and sensors.

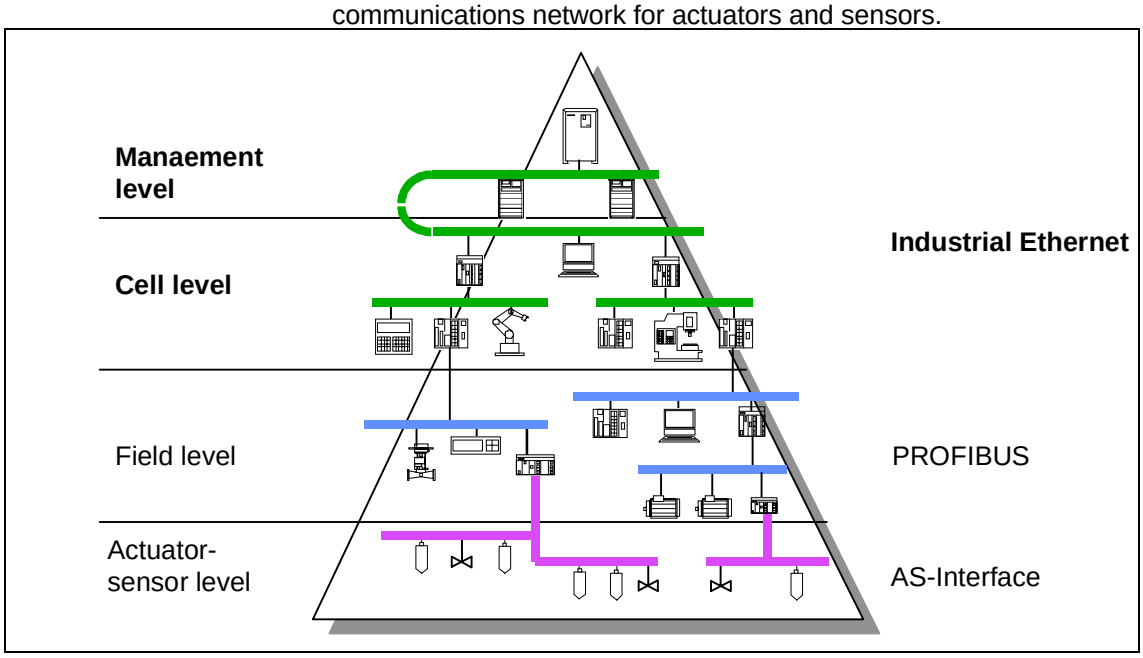


Figure 3.1 SIMATIC NET Communications Networks

3.3 Industrial Ethernet

Area of Application

The area and cell network Industrial Ethernet is an industrial communication network intended for use in manufacturing and in industrial plants. It provides a comprehensive range of network components for electrical and optical transmission.

Industrial Twisted Pair (ITP)

Industrial **T**wisted **P**air (ITP) is an alternative to conventional bus cabling providing a LAN cable with 2 x 2 or 4 x 2 wires and enhanced immunity to noise.

Basics

The cell and area network Industrial Ethernet is based on the specifications of the IEEE 802.3 standard (Ethernet). It operates using the medium access method CSMA/CD (**C**arrier **S**ense **M**ultiple **A**ccess with **C**ollision **D**etection).

Network Components

The network components of Industrial Ethernet implement electrical networking via shielded coaxial LAN cable (triaxial cable).

Optical Transmission Media

The optical transmission media implement networks via fiber-optic cables.

The advantages of optical transmission media are as follows:

- Unaffected by electrical interference
- Long distances can be covered

3.4 Multiprotocol Operation

What is Multiprotocol Operation?

In multiprotocol operation, you work using several protocols on one computer.

This applies both to the use of more than one protocol within **one** user program as well as for parallel operation of **more than one** user program with different protocols.

What is Multidevice Operation?

In multidevice operation, several CP 1613 communications processors can be installed and operated at the same time.

This is possible both with **one** user program or with **more than one** user program.

Support of Multiprotocol Operation

Support for multiprotocol operation may be restricted with certain communications processors and operating systems. For more detailed information, refer to the appropriate product information.

3.5 Structure of the Software and Hardware Components of the CP 1613 under Windows NT on the Computer

PG 1613/ Windows NT

The software package of the CP 1613 for Industrial Ethernet **PG 1613/Windows NT** is located in layers 2b to 4 within the ISO/OSI model. Layer 3 (Network layer) is inactive if ISO transport is selected.

S7/TF 1613/ Windows NT

The software package of the CP 1613 for Industrial Ethernet **S7 1613/Windows NT** and **TF 1613/Windows NT** are located in layers 2b to 7 within the ISO/OSI model. Layer 3 (Network layer) is inactive if ISO transport is selected.

Layers 5 to 7

Layers 5 to 7 of the ISO/OSI model are covered by the user programs or the S7/TF programming interface.

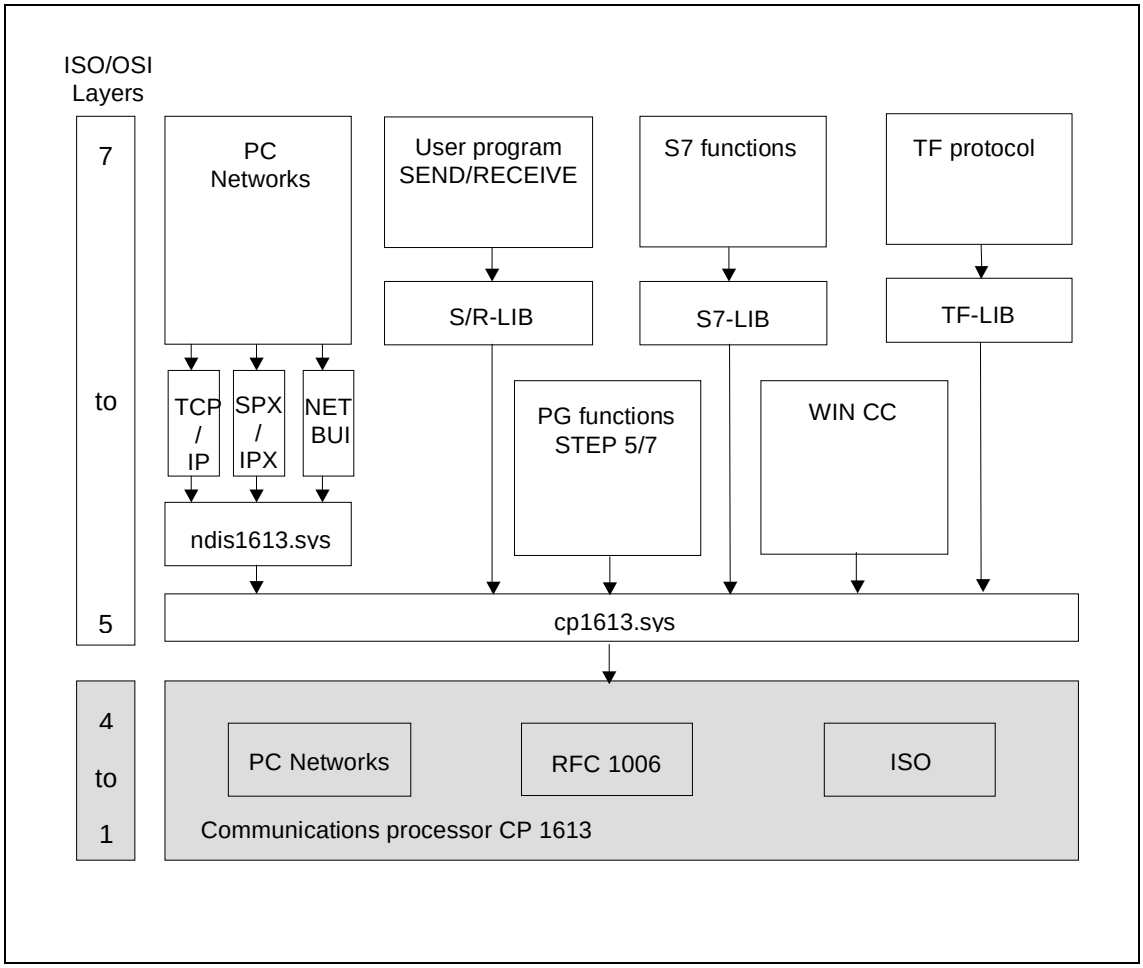
Layers 1 and 2

Layers 1 and 2 are handled on the CP 1613.

Structure of the Software and Hardware Components

The following schematic shows the communications software packages of CP 1613 for Industrial Ethernet within the overall software concept.

Programs executed on your own computer are shown without shading, programs running on the CP 1613 are shown on a gray background.



3.6 SAPI-S7, TF and SEND/RECEIVE Programming Interface

Compatibility

The SAPI-S7 programming interface of **S7 1613/Windows NT** and the TF programming interface of **TF 1613/Windows NT** are layer 7 interfaces (Application layer).

The supplied SEND/RECEIVE programming interface is a layer 4 interface (Transport Layer).

Communication with Programmable Controllers of SIMATIC S5

Communication with the handling blocks of the programmable controllers of SIMATIC S5 is straightforward using the calls of the SEND/RECEIVE programming interface or the TF programming interface.

The call structure and the sequence of communication with programmable controllers of SIMATIC S5 is described in detail in the manual "SEND/RECEIVE Programming Interface" or "TF Programming Interface".

Communication with Programmable Controllers of SIMATIC S7

Ideally, communication with SIMATIC S7 uses the S7 programming interface.

As an alternative, the SEND/RECEIVE programming interface can be used with certain restrictions.

The call structure and the sequence of communication with programmable controllers of SIMATIC S7 is described in detail in the manual "S7 Programming Interface" or "SEND/RECEIVE programming interface".

Advantages of the S7 Programming Interface

The S7 Programming Interface provides far more convenient communication functions than the SEND/RECEIVE programming interface, for example "write/read variables".

Advantages of the SEND/RECEIVE Programming Interface

All programs that use the SEND/RECEIVE interface have simple access to SIMATIC S5.

Advantages of the TF Programming Interface

The TF programming interface is provided mainly for users planning to change from earlier modules to the CP 1613 (protection for investment).

Independence from Programming Languages

The SEND/RECEIVE and the SAPI-S7 programming interfaces are intended for the use of C and C++. They can, however, be used for other progamming languages since the interfaces are implemented as DLLs. Links to Visual Basic already exist.

The TF programming interface is **only (!)** intended for the programming language C.

Support for Programmers

To help programmers to become familiar with working with the programming interfaces SAPI-S7, SEND/RECEIVE, and TF in the software packages of the CP 1613, the following components are also supplied in addition to the documentation already listed:

- Sample programs
- A call library

Sample Programs

Sample programs are supplied with the software package of the CP 1613 for Industrial Ethernet. They are written in the "C" programming language.

Within the context of the program, they illustrate how the interface works and parts of the program can be copied and adapted to real situations.

Call Library

Further support is provided by the call library for function calls of the SAPI-S7, SEND/RECEIVE or TF interface. This library is written in "C".

For C programmers, this means the following:

- The call library can be linked directly into your own software.
- The required calls can be used directly as illustrated by their use in the sample programs.

The required data structures (with SEND/RECEIVE the request block) are described not only in the manual but also in a second practical form in the program samples and function calls.

4 Where to Get Help

This chapter lists people to contact about SIMATIC NET:

- Who to contact about technical questions
- Who to contact about training on SIMATIC NET products

4.1 Help with Technical Questions

Documentation

Information about using this product can be found in the following sources:

- In the corresponding paper documentation
- In the online help (F1 key)
- In the text and PDF files on the SIMATIC NET CD
- In the following manuals of the S7-400 H programmable controller
  - Fault-Tolerant Systems
  - Configuring Hardware and Communication Connections with STEP 7 V5.0
  - Programming with STEP 7 V5.0

Who to Contact

If you have technical questions about using the software and your problem is not dealt with in the documentation or in the integrated help system, please contact your Siemens representative or dealer.

The addresses are listed in the following:

- In our catalog IK 10
- On the Internet (http://www.ad.siemens.de/net)
- In the "README.TXT" file in the main folder of the SIMATIC NET CD

Courses and Further Support

The H/F Competence Center in Nuremberg offers a special workshop on the topic of fault-tolerant SIMATIC S7 programmable controllers. The H/F Competence Center also supports you during configuration, when putting your system into operation and if you have problems on site.

For more detailed information, contact:

- Phone: +49 - 911 - 895 - 4759)
- Fax: +49 - 911 - 895 - 4519)

Common Questions

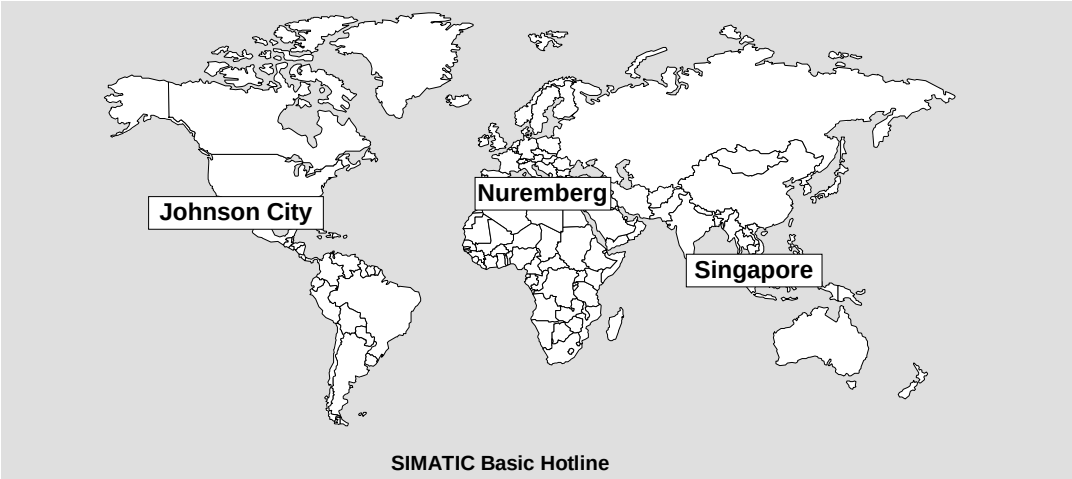
Our customer support on the Internet provides useful information and answers to commonly asked questions. Under FAQ (**F**requently **A**sked **Q**uestions), you will find information about the entire range of products.

The address of the SIMATIC NET home page in the World Wide Web of the Internet is as follows:

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

SIMATIC Customer Support Hotline

Open round the clock, worldwide:



Nuremberg	
SIMATIC BASIC Hotline	**SIMATIC Premium Hotline** (Calls charged, only with SIMATIC Card)
Local time: Mo to Fr 8:00 to 18:00 (CET) Phone: +49 (911) -895-7000 Fax: +49 (911) -895-7002 E-mail: simatic.support@nbgm.siemens.de	Local time: Mo to Fr 0:00 to 24:00 (CET) Phone: +49 (911) -895-7777 Fax: +49 (911) -895-7001

Johnson City **SIMATIC BASIC Hotline**	**Singapore** **SIMATIC BASIC Hotline**
Local time: Mo to Fr 8:00 to 17:00 Phone: +1 423 461-2522 Fax: +1 423 461-2231 E-mail: simatic.hotline@sea.siemens.com	Local time: Mo to Fr 8:30 to 17:30 Phone: +65 740-7000 Fax: +65 740-7001 E-mail: simatic@singnet.com.sg

Authorization Hotline

If you have problems with your authorization, you can contact our authorization hotline:

- Phone: +49 - 911 - 895 - 7200
- Telefax: +49 - 911 - 895 - 4212

4.2 Who to Contact for SIMATIC NET Training

Course Registration

Siemens AG
Trainings-Center für Automatisierungstechnik
AUT 959 Kursbüro

Östliche Rheinbrückenstraße 50
76181 Karlsruhe
Germany

Phone +49 - 721 - 595 - 2917

Fax +49 - 721 - 595 - 6987

Glossary

CP — **C**ommunications **P**rocessor - Communications module/network adapter for installation in computers or programmable controllers.

Drivers — Software that allows data exchange between applications and the CP client.

ISO — **I**nternational **S**tandards **O**rganization - international organization based in Geneva responsible for producing general standards particularly for data transmission.

ITP — **I**ndustrial **T**wisted **P**air - LAN cable with 2 x 2 or 4 x 2 wires for use in an industrial environment.

NDIS — **N**etwork **D**evice **I**nterface **S**pecification - a software interface with specifications by Microsoft®.

Network — A network consists of one or more interconnected subnets with any number of nodes. Several networks can exist one beside the other. For each subnet, there is a common node table.

OSI — **O**pen **S**ystem **I**nterconnection - an architecture concept for data communication between information systems developed and published by the ISO.

Protocol — A set of rules governing data transmission. Using these rules, both the formats of the messages and the data flow during transmission can be specified.

RFC 1006 RFC 1006 is an international standard that describes the functions of ISO layer 4 on TCP.

S5 PLC Abbreviation for a programmable controller of the SIMATIC product family from Siemens AG.

S7 programming interface The SAPI S7 programming interface was developed for user programs on programming devices, PCs, or workstations to allow simple access to SIMATIC S7/M7 system components.

Services Services provided by a communication protocol.

SIMATIC S7 SIMATIC S7 is a family of controllers for automation engineering from Siemens. SIMATIC S7 is the successor of the PLC system SIMATIC S5 on a completely new platform.

SINEC **Si**emens **Ne**twork and **C**ommunication - previous product name for networks and network components from Siemens; today SIMATIC NET.

SINEC L2 SINEC bus system for industrial applications based on PROFIBUS.

SR interface **S**END/**R**ECEIVE programming interface, known as PC-E-S5 programming interface.

System All the electrical equipment within a system. A system includes, among other things, programmable logic controllers, devices for operation and monitoring, bus systems, field devices, actuators, cabling.

TCP/IP **T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol - standardized protocol for the transport layer or network layer (OSI) for communication between programs with different data processing systems.

TF programming interface User programs on the programming device, PC, or on a workstation use the technological functions via the TF programming interface.. In terms of their functionality, the technological functions correspond to the international MMS services in compliance with ISO IS 9506.

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