

## SIMATIC NET for SIMOTION

### Product Information

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## Classification of Safety–Related Notices

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



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### Danger

Indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury or in heavy damage to property.

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### Warning

Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury

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### Caution

Used **with** the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury.

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### Caution

Used **without** the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **may** result in property damage.

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### Notice

Indicates a potential situation which, if not avoided, **may** result in an **undesirable** result or state.

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## Safety Instructions Regarding your Product:

Before you use the product described here, read the safety instructions below thoroughly.

### Qualified Personnel

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

### Correct Usage of Hardware Products

Note the following:



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#### Warning

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

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

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

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

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### Correct Usage of Software Products

Note the following:



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#### Warning

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

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

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Bundesrepublik Deutschland

#### Disclaimer of Liability

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

Technical data subject to change.



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# Introduction

## What is SIMOTION?

SIMOTION is an extensive system for the automation of production machines focusing on motion control.

SIMOTION comprises:

- SIMOTION SCOUT,  
an engineering system for creating a project by:
  - Configuring, programming, parameterizing
  - Graphical or text-based programming
  - Transfer to the kernel of e.g. SIMOTION C230-2

The project includes the hardware configuration and user data.

- SIMOTION Kernel  
A kernel for various hardware platforms.

## What is SIMATIC NET?

SIMATIC NET provides a default OPC server which enables access to the most different communication partners via the open OPC interface.

For a detailed description of SIMATIC NET please see the CD-ROM "SIMATIC NET PC/Windows 07/2001".

## Which functionality is provided by SIMATIC NET for SIMOTION?

SIMATIC NET for SIMOTION provides:

- Access via OPC Data Access, enabling the user to read and write a SIMOTION device (e.g. control and multi-axis module SIMOTION C230-2)
- to monitor a process being executed in a SIMOTION system via OPC alarm and events.

## 1.1 Basic representation of design time

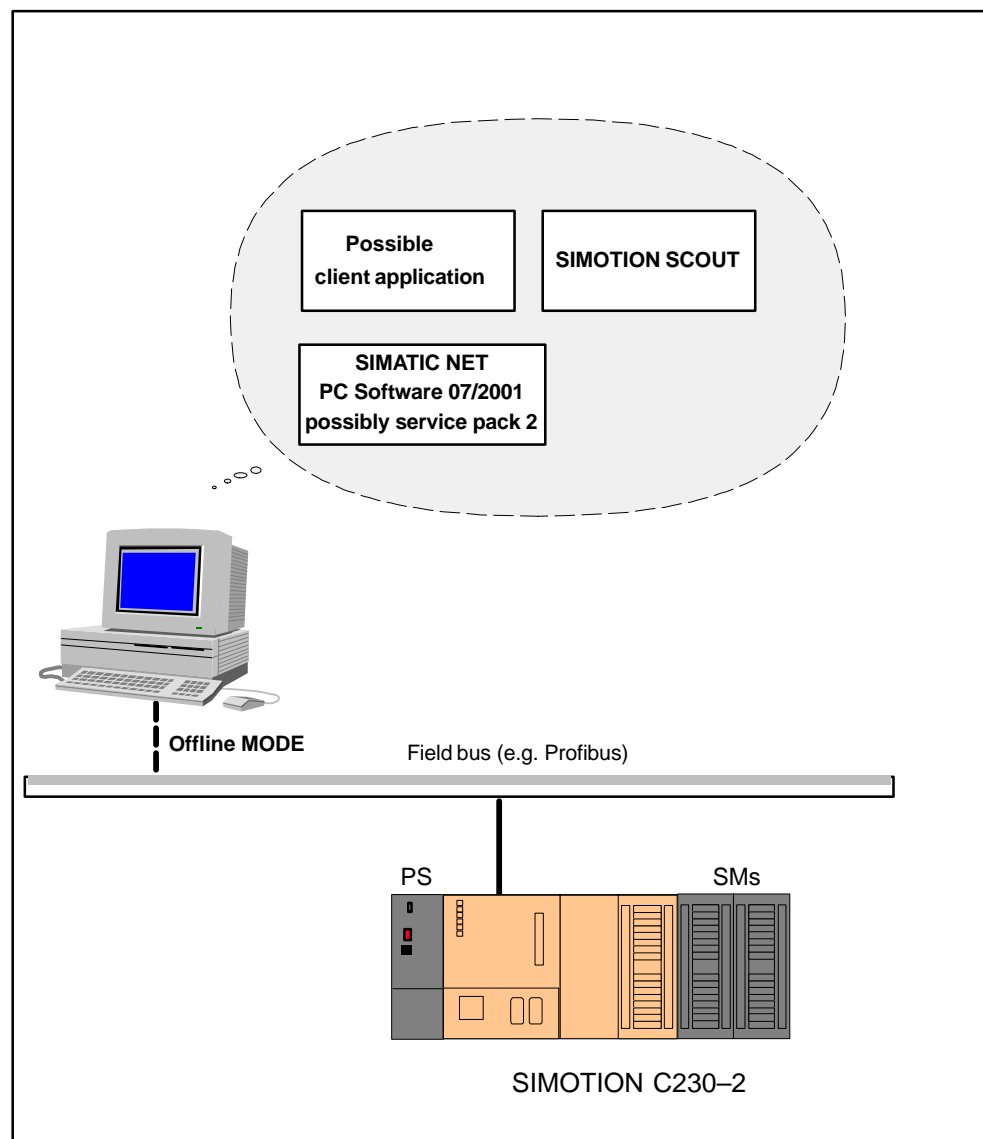


Figure 1-1 Overview design time (Example)



## 1.2 Basic representation of runtime

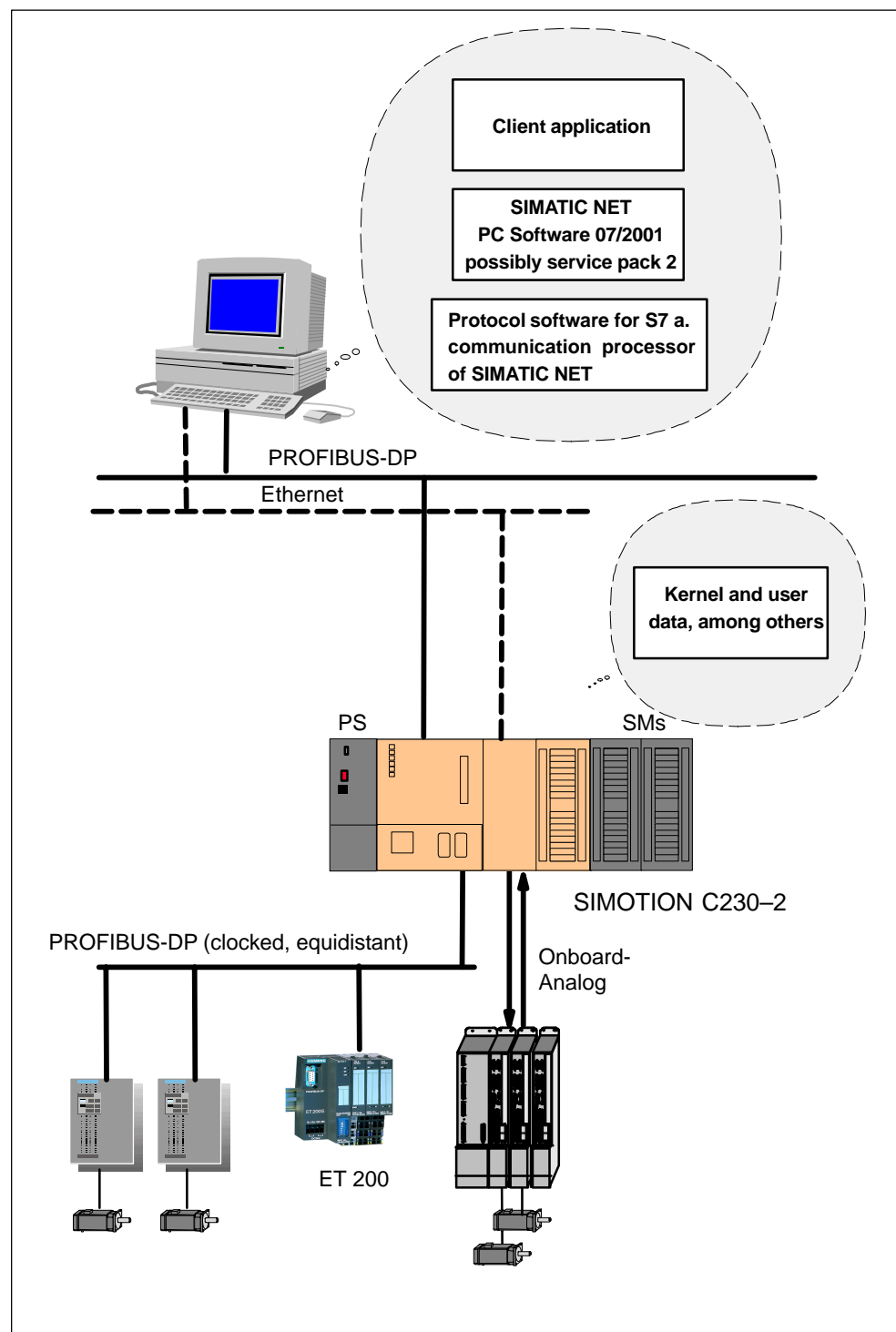


Figure 1-2 Overview runtime (Example)



# Installation Guide

# 2

## 2.1 Hardware and Software requirements for design time

### Hardware requirements for design time

Table 2-1 Hardware requirements for design time

Configuration	Minimum requirements
Processor	Intel Pentium II or compatible, 333 MHz
User memory	128 MByte RAM
Resolution	800 x 600 Pixel

### Software requirements for design time

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#### Note

Install the software following this order!

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1. Windows NT<sup>®</sup> 4.0, service pack 6a and higher, or Windows 2000 service p. 1
2. STEP 7  
Version 5.1 service pack 2  
and higher
3. SIMATIC NET PC Software  
Version 6.0 (CD 07/2001)  
and higher  
A licence for design time will  
not be required for the  
OPC server.  
  
and when using "OPC Alarms and Events"  
also service pack 2  
Version 6.0.2  
(CD 07/2001 with service pack 2)  
Product name: "SIMATIC NET SOFTNET-S7 (S7-OPC-Server)"
4. SIMOTION SCOUT  
Version 2.0 and higher

## 2.2 Hardware and Software requirements for runtime

### Hardware requirements for runtime

Table 2-2 Hardware requirements for runtime

Configuration	Minimum requirements
Processor	Intel Pentium II, 266 MHz
User memory	128 MByte of RAM
Monitor	VGA monitor, keyboard and mouse supported by Microsoft Windows NT
Memory	Approx. 25 Mbytes of space on your hard disk  At least 1 Mbyte of space on drive C: for the Setup program (the setup files are deleted again after successful installation)
Network cards	Profibus card, e.g. CP5611 and/or Ethernet card
SIMOTION device	SIMOTION C230-2 with micro memory card (restricted operation is possible even without card) resp. SIMOTION P350

### Software requirements for runtime

- Client/server
  - Windows NT<sup>®</sup> 4.0 service pack 6a, or Windows 2000 service pack 1
  - SIMATIC NET PC Software                      Version 6.0 (CD 07/2001) and higher  
     and when using "OPC Alarms and Events" also service pack 2                      Version 6.0.2 (CD 07/2001 with service pack 2)  
     Product name: "SIMATIC NET SOFTNET-S7 (S7-OPC-Server)"
- SIMOTION C230-2
  - SIMOTION Kernel                                      (Kernel, will be supplied)
- SIMOTION P350
  - SIMOTION Kernel



## Communication and Handling

### 3.1 Basic procedure

For communication between the OPC server for SIMATIC NET with a SIMOTION device you will have to make some preparations:

Basic tasks:

Table 3-1 Basic procedure

When?	Step	Procedure	Note
Design time/ run time	1	Installing the SIMATIC NET PC–Software and the communication processor	See section 3.3
Design time	2	Creating a project with SIMOTION SCOUT for SIMOTION device	See "Operator's Guide" for SIMOTION SCOUT
Design time	3	Exporting OPC data in offline mode	See section 3.2
Design time	4	Developing a client application on the basis of OLE/COM-DCOM	For example in Visual Basic
Runtime	5	Loading the project to SIMOTION device	See "Operator's Guide" for SIMOTION SCOUT

## 3.2 Exporting OPC data at the design time

In order to inform SIMATIC NET about all data configured in SIMOTION SCOUT, you have to export all usable data into a file using the menu *Options → Export OPC data...* (i.e., at the design time) and then transfer the created files "OPC\_DATA.ssd" and "OPC\_AE.xml" to the OP.

You have the possibility to export the following data:

- "OPC Data" comprising
  - System variables of the unit and technological objects
  - Global system user variables
  - Symbolic input/output variables
  - Interface variables of user programs  
(for data types, see chapter 4.1)
- "OPC Alarm/Event", including
  - TO alarms
  - Diagnostic buffer alarms
  - Alarm\_S/Q

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### Note

The online help in SIMOTION SCOUT describes in detail the operating sequences required in order to export OPC data.

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You have the possibility to set the target directory for the symbol file.

This is the default path set by the system: "<LW>:\Siemens\Step7\S7proj\<Project\_name>\U7\Tagfiles\"

### 3.2.1 Parameterizing the data export

If several interfaces are selected, the data export requires the following parameters:

- the device

It displays the device for which you have to select the interface to PROFIBUS DP. You have to define the interface setting for every device in the project. Depending on the number of devices you will have to repeat the settings in this window.
- the protocol
  - PROFIBUS
  - TCP/IP (C230-2)
- the interface

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### Note

The selection "Interface" appears, when several interfaces are available in the SIMOTION device and were configured with different bus addresses.

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Under "Interface" you can select the interface for the symbol names you want to export.

Each symbol name must be clearly assignable to a hardware address (bus address).

You can define this assignment by selecting the "interface".

- Select X8, if you use interface X8 on the device.
- Select X9, if you use interface X9 on the device.

**Danger**

If the interface has been parameterized for equidistant bus cycle, this interface must not be used for OPs that have not been enabled for equidistant bus.

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### 3.2.2 Exporting OPC data (symbol file)

The export of "OPC Data" may take some time. However, you have the possibility to shorten the data export procedure by selecting "Flat hierarchy" (i.e. w/o tree structure) resp. "Arrays with individual elements" (if this is not selected, only the first address of the array will be exported).

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**Note**

If a client has been programmed for SIMATIC NET which uses symbol files that have been generated with SIMOTION SCOUT Version 1.0 or 1.1, the field "Flat hierarchy" must be selected when exporting "OPC Data" with SIMOTION SCOUT Version 2.0. If this is not the case, you have to adapt the variable names of the Client.

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By default, a symbol file is stored under the name "OPC\_DATA.ssd" in the target directory selected when exporting "OPC Data".

The export process will be recorded under SIMOTION SCOUT in Detail View of tab sheet *Symbol file Export status View*.

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**Note**

OPC data export will only be possible, if

- the SIMATIC NET software for PC is installed,
  - a project is open and
  - SIMOTION SCOUT runs in OFFLINE mode.
-

### 3.2.3 Exporting "OPC Alarm/Event"

By default, a file is stored under the name "OPC\_AE.xml" in the target directory selected when exporting "OPC Alarm/Event".

The export process will be recorded under SIMOTION SCOUT in Detail View of tab sheet *Symbol file Export status View*.

## 3.3 Configuring the OPC server/SIMOTION device interface at runtime

Table 3-2 Configuring the interface

Step	Procedure
1	<b>Mount the PROFIBUS or Ethernet communication module (e.g. CP5611) to the PC. Install the SIMATIC NET PC software version 6.0 and also service pack 2 when using "OPC Alarms and Events".</b>
2	<p><b>The start-up assistant now starts automatically. You can also call the start-up assistant via menu <i>Start→SIMATIC→SIMATIC NET→Settings→Start-up assistant</i>.</b></p> <p><b>Set the properties in the pages described in the following according to the indications. Skip the pages which are not described by pressing <i>Next</i>.</b></p> <ol style="list-style-type: none"> <li>Click on the field "Use module for PG operation only" on page "Settings for PROFIBUS module" <b>Note:</b> this dialog only appears once.</li> <li>On the page "Symbolic", select the field "Use symbol file".</li> <li>If you want to use "Data" and "Alarms and Events" resp. "Data" only, please enter the file name of the symbol file, e.g. " LW:\Siemens\Step7\S7proj\TagFiles\OPC_DATA.ssd" . If you want to use only "Alarms and Events", select in "Set PC station" the file " LW:\Siemens\Step7\S7proj\TagFiles\OPC_AE.XML". (You will always be suggested the previous path.)</li> <li>Select the SIMOTION module (e.g. "CP5611 (PROFIBUS)" on page "Extended symbols". <b>Note:</b> For installation on SIMOTION P350 do not execute this step! Please follow the instructions on the next page.</li> <li>By selecting <i>Finish</i> you finish the installation setup for the SIMATIC NET OPC Server.</li> </ol>
3	<p><b>Testing the communication processor.</b></p> <p>You can test the correct function of the module in the window "Set the SIMATIC NET PC station" (can also be called via menu <i>Start→SIMATIC→SIMATIC NET→Settings→</i>).</p> <p>In order to do so, select the module (e.g. "CP5611") and then click the button <i>Update</i> under "Node".</p>



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**Note**

The symbol file button can only be activated when a symbol file is existing.  
If any changes of project data are made using SIMOTION SCOUT after tag file export, a new exporting procedure must be executed (for consistency).

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**Note**

For installation on SIMOTION P350, configure the interface (as described in table 3-2), then go to "PG/PC interface settings" and connect access point **CP\_SM\_1:** with **SINUMERIK MCI BOARD (MPI)**!

When configuring the interface, you must not execute step 4. in step 2!

You can set the access point in the menu *Start*→*SIMATIC*→*SIMATIC NET*→*Settings*→*PG-PC interface*.

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# System Features

# 4

## 4.1 System variables

For more detailed information on the exported files, you can start an XML export using SIMOTION SCOUT via menu *Project→Save and export*.

You can afterwards view this XML file by means of an XML-capable web browser (e.g. Internet Explorer 5 or Netscape 6.1).

This file includes information about variables such as limit values, file types and the defined values for enum-types.

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### Note

In order to use enums within an OPC client, a description file (idl file) will be generated in addition to the symbol file during OPC data export via menu *Tools→Export OPC data...*

You find a description of the limit values of the system variables for SIMOTION in the list of references "SIMOTION Technological Package CAM System Variables".

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The following data types are available for SIMOTION:

Table 4-1 Data types

SIMOTION	Bit size	Sign
BOOL	1 Bit	–
BYTE/USINT	8 Bit	–
SINT	8 Bit	yes
WORD/UINT	16 Bit	–
INT	16 Bit	yes
DWORD/UDINT	32 Bit	–
DINT	32 Bit	yes
REAL	32 Bit	yes
LREAL	64 Bit	yes
DATE	–	–
TD (Time of Day)	–	–
DT (Date and Time)	–	–

Table 4-1 Data types, Fortsetzung

SIMOTION	Bit size	Sign
TIME	–	–
Array	Note: For "Array" the above listed data types are valid only.	

## 4.2 Consistent data access

Access to individual data of a simple data type of the SIMOTION device is always consistent.

But if you want to access several individual data or arrays of the SIMOTION device (e.g. positions of several axes), you will require user support in order to assure consistency.

The Programming Guide SIMOTION ST describes with a programming example how the client application (e.g. HMI device) guarantees consistent data access with the SIMOTION device by means of mutual verifying.

## 4.3 Compatibility with version 2.2

When using the S7 OPC Server service pack 2 for SIMATIC NET version 2.2, you will have to note the following in order to guarantee compatibility with software SIMATIC NET version 6.0:

### Upward compatibility

Table 4-2 Upward compatibility

PC with design time	PC with runtime
S7 OPC server service pack 2 for SIMATIC NET version 2.2  <b>Note:</b> Here, the exported access is <b>CP_L2_1:</b>	SIMATIC NET version 6.0  <b>Note:</b> Access <b>CP_L2_1</b> : must be set here. The access can be set via menu <i>Start→SIMATIC→SIMATIC NET→</i> <i>Settings→ Set the PC station</i>

#### Note

We recommend you to use the new software SIMATIC NET version 6.0 on both devices.

### OPC Alarm and Events

OPC Alarm and Events functions are available as from Version 6.0 service pack 2.





# Notes on Online Help and Documentation

# 5

Table 5-1 Online help and documentation

What?	Names	Contents
Online help SIMOTION SCOUT	Is part of the SIMOTION SCOUT software	Provides help for the user interface
Entire documentation on installation CD of the SIMOTION software	SIMOTION System Overview	Overview of the product family
	SIMOTION Getting Started, Short Operator's Guide	For a fast access to the engineering system SIMOTION SCOUT
	SIMOTION SCOUT, Operator's Guide	Describes the engineering system SIMOTION SCOUT, its installation and workbench
	SIMOTION MCC, Programming Guide	Describes the graphical SIMOTION programming language Motion Control Chart
	SIMOTION ST, Programming Guide	Describes the text-based SIMOTION programming language Structure Text
	SIMOTION C230-2, Product Manual	Describes the hardware and start-up
	SIMOTION Technological Functions of Motion Control, (divided up in several manuals and lists of references)	Describes the effects of the technological objects for Motion Control and provides the reference lists of system variables and functions
	SIMOTION Function Blocks	Extension for CP and FM modules
	SIMOTION P350, Manual	Describes hardware, software and installation
Entire documentation on installation CD of the SIMATIC NET software	SIMATIC NET PC/Windows 07/2001, electronic documentation	Describes the installation, the OPC interface and OPC server

## Note

See the References of the SIMOTION manuals for a detailed list of the documentation on SIMOTION.







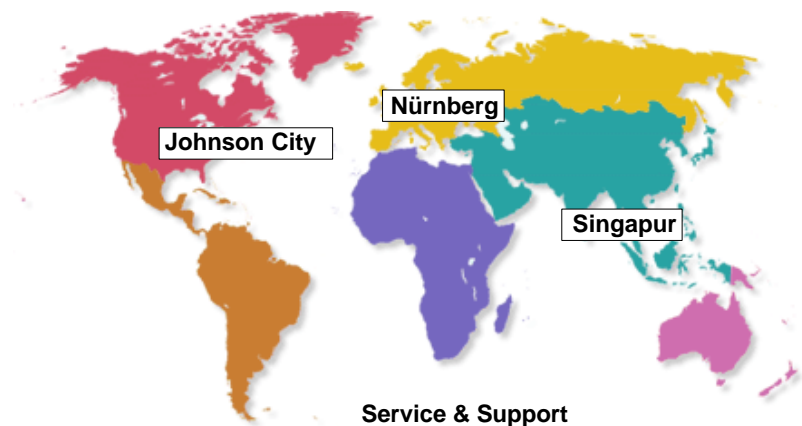
# SIMATIC NET – Support and Training

# A

## Automation and Drives, Service & Support

Der Service & Support von A&D ist weltweit jederzeit erreichbar.

The languages of the SIMATIC Hotlines are generally German and English, in addition, French, Italian and Spanish are spoken on the authorization hotline.



Technical Support		Authorization–Hotline	
<b>Europe and Africa</b> (Nuremberg) Mon.– Fri. 7:00 to 17:00 (Local time, GMT +1) Phone: +49 – (0) 180 – 5050 – 222 Fax: +49 – (0) 180 – 5050 – 223 E–Mail: techsupport@ad.siemens.de		<b>Europe and Africa</b> (Nuremberg) Mon. – Fri. 7:00 to 17:00 (Local time, GMT +1) Phone: +49 – (0) 911 – 895 – 7200 Fax: +49 – (0) 911 – 895 – 7201 E–Mail: authorization@nbgm.siemens.de	
		<b>America</b> (Johnson City) Mon. – Fri. 8:00 to 19:00 (Local time, GMT –5) Phone: +1 – (0) 423 – 262 – 2522 Fax: +1 – (0) 423 – 262 – 2231 E–Mail: simatic.hotline@sea.siemens.com	
		<b>Asia and Australia</b> (Singapur) Mon. – Fri. 8:30 to 17:30 (Local time, GMT +8) Phone: +65 – (0) 740 – 7000 Fax: +65 – (0) 740 – 7001 E–Mail: simatic.hotline@sae.siemens.com.sg	
SIMATIC Premium–Hotline			
<b>Worldwide</b> (Nuremberg) on weekdays 0:00 to 24:00 (Local time, GMT +1) Phone: +49 – (0) 911 – 895 – 7777 Fax: +49 – (0) 911 – 895 – 7001 E–Mail: techsupport@ad.siemens.de		quick call–back guaranteed within max. 2 hours (fee based, only with SIMATIC Card)	

## Training Center

To help you become familiar with SIMATIC S7 programmable controllers, we offer training courses. Please contact your regional training center or the central training center in D 90327 Nuremberg.

Phone: +49 (0) 911–895–3154  
Infoline: Tel. +49 (0) 1805 23 56 11  
Fax. +49 (0) 1805 23 56 12  
Internet: <http://www.sitrain.com>  
E-Mail: AD-Training@nbgm.siemens.de

For information on high-availability SIMATIC S7 automation systems, the H/F Competence Center in Nuremberg offers a special workshop. The H/F Competence Center will also support you during configuring, start-up and in case of any problems occurring at site.

Phone: +49 – (0) 911 – 895 – 4759  
Fax: +49 – (0) 911 – 895 – 5193  
E-Mail: hf-cc@nbgm.siemens.de  
CoC-SI@nbgm.siemens.de

## Technical Support Online Services

SIMATIC Customer Support provides you with a wide range of additional information on SIMATIC products in the online services:

- You can obtain general up-to-date information as follows:
  - on the Internet: address <http://www.siemens.de/simatic-net>
  - at fax polling no. +49 (0) 8765-93 02 77 95 00
- For current product information, FAQs, tips and hints and downloads which may be helpful for your application, see:
  - On the Internet: address <http://www.siemens.de/automation/service&support>
  - From the bulletin board system (BBS) in Nuremberg (*SIMATIC Customer Support Mailbox*) at the number +49 (0) 911 895-7100.

To dial the mailbox, use a modem with up to V.34 (28.8 Kbaud), with the following parameters: 8, N, 1, ANSI, or dial on ISDN (x.75, 64 Kbits).

## Further Support

If you have further questions about SIMATIC NET products, contact your local Siemens representative.

You will find the addresses:

- in our catalog IK PI
- on the Internet <http://www.siemens.de/automation/partner>
- in our interactive catalog CA01  
<http://www.siemens.de/automation/ca01>
- on our quick-start CD



