

SIEMENS



SIMATIC Controllers

The innovative solution for all automation tasks

SIMATIC

Overview

Edition
November
2012

Answers for industry.

SIMATIC Controllers

System-wide engineering, communications and diagnostics

SIMATIC Modular Controllers



Your benefits

- Ready to use
- Long-term compatibility and availability
- For use in harsh environments
- Modular expansion and scalability
- Vibration-resistant
- Maintenance-free

Fields of application

- Controlling with centralized and distributed I/O
- Technological tasks
- Fault-tolerant control
- Fail-safe control

You need optimal solutions for every application area to enable you to automate your machines and plants economically and flexibly.

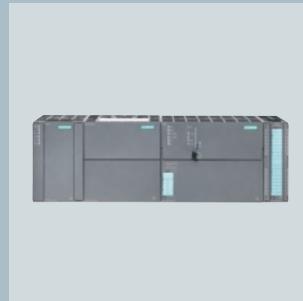
Whether you want open-loop control, or you also want to cover other additional automation applications such as visualization, technology or data archiving – we always have the right solution for you! And with a unique level of integration in engineering, communications and diagnostics.

Our SIMATIC Controllers are based on different hardware and software architectures:

SIMATIC Modular Controllers

The Modular Controllers have been optimized for control tasks and specially designed for ruggedness and long-term availability. They can be flexibly expanded at any time using plug-in I/O modules, function modules, and communication modules. Depending on the size of the application, the right controller can be selected from a wide range according to performance, quantity frameworks, and communication interfaces. The modular controllers can also be used as fault-tolerant or fail-safe systems.

SIMATIC PC-based Controllers



Your benefits

- Flexible in use
- Openness in hardware and software configuration
- Use of existing PC resources
- Participation in the continuous PC innovation process
- Multifunctional
- Customized PC variants
- Embedded bundles:
 - Ready to use
 - Rugged
 - Maintenance-free

Fields of application

- Control, operator control and monitoring
- Technological tasks
- Data acquisition and archiving
- Link to PC hardware and software
- Integration of C/C++/C# programs
- Data exchange via OPC
- Fail-safe control

SIMATIC PC-based Controllers

SIMATIC PC-based Controllers use the realtime-capable software controller WinAC RTX or its fail-safe variant WinAC RTX F on the basis of Windows operating systems. Any PC applications, operator control and monitoring tasks, as well as technological functions can simply be combined here to form an overall automation solution. The SIMATIC embedded bundles, with their highly rugged design and pre-installed, ready-to-use automation software, allow the advantages of PC-based Automation to be implemented at the machine.

SIMATIC Controllers

The complete range at a glance

SIMATIC Modular Controllers							
Control	S7-1200	ET 200 with CPU	S7-300	S7-400	S7-1500		
					 NEW		
	www.siemens.com/simatic-s7-1200	www.siemens.com/et200	www.siemens.com/simatic-s7-300	www.siemens.com/simatic-s7-400	www.siemens.com/simatic-s7-1500		
Controlling with technology functions	S7-1200	ET 200	S7-300 with Easy Motion Control or technology CPU (optionally with Safety)	S7-400 with FM 458	S7-1500		
					 NEW		
	www.siemens.com/simatic-s7-1200	www.siemens.com/et200	www.siemens.com/simatic-s7-300	www.siemens.com/simatic-s7-400	www.siemens.com/simatic-s7-1500		
Fail-safe control	ET 200 with F-CPU		S7-300 with F-CPU	S7-400 with F-CPU			
							
	www.siemens.com/et200		www.siemens.com/simatic-s7-300	www.siemens.com/simatic-s7-400			
Fault-tolerant control			S7-400 H-System optionally with Safety				
							
			www.siemens.com/simatic-s7-400h				
Control, operator control and monitoring							

Totally Integrated Automation

SIMATIC Controllers are an essential component of Totally Integrated Automation. The extensive range of products makes it possible to find the right solutions for the most

diverse application areas – in cost-sensitive standard production as well as in plant building and special mechanical equipment manufacture, where reduction of the engineering and startup costs plays a crucial role.

SIMATIC PC-based Controllers

Software Controllers for Multi Panels

WinAC RTX



www.siemens.com/simatic-winac

WinAC RTX with Easy Motion Control



www.siemens.com/simatic-winac

WinAC RTX F



www.siemens.com/simatic-winac-rtx-f

S7-mEC-RTX F

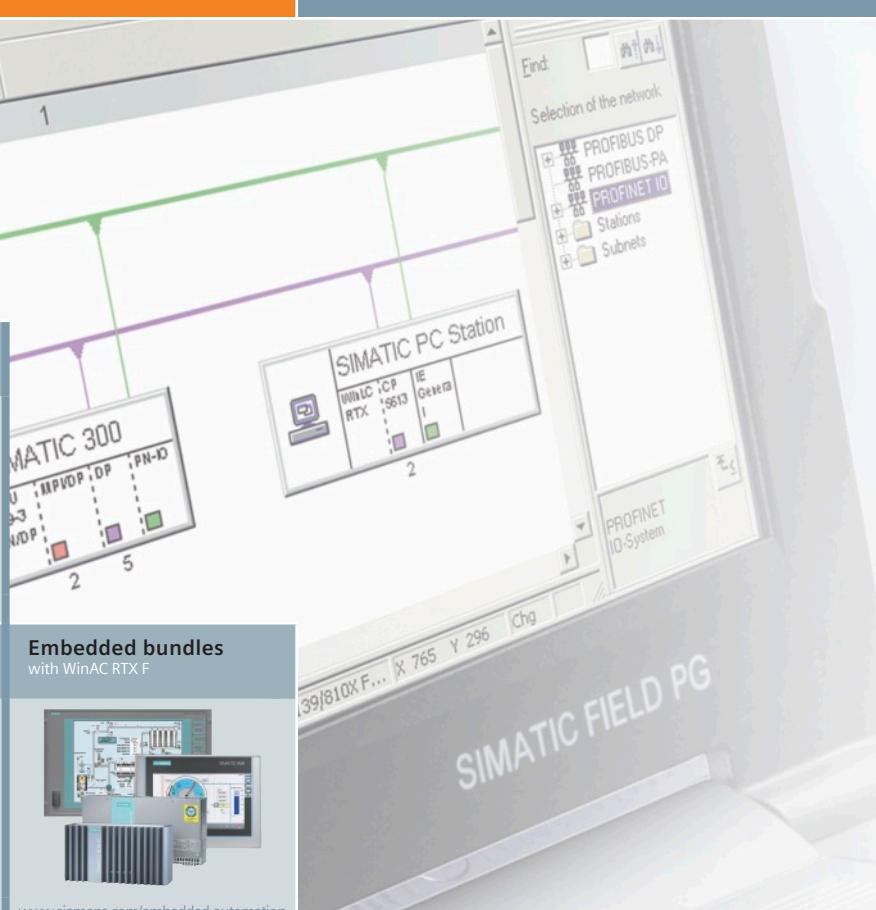


www.siemens.com/simatic-s7-mec

Customized functions with WinAC ODK



www.siemens.com/simatic-winac-odk



Embedded bundles with WinAC RTX F



www.siemens.com/embedded-automation

S7 Modular Embedded Controller



www.siemens.com/simatic-s7-mec

IPC227D/IPC427C bundles with WinAC RTX (F) and HMI-Software



www.siemens.com/simatic-ipc227d

HMI IPC277D/IPC477C bundles with WinAC RTX (F) and HMI-Software



www.siemens.com/simatic-ipc277d

WinAC MP 177/277



WinAC MP 377



Selection guide

SIMATIC Modulare Controllers

	S7-1200	ET 200 with CPU	ET 200pro	S7-300
SIMATIC product/family				
Product Brief	Modular, compact controller for discrete and stand-alone automation solutions	Distributed, discretely-modular I/O system with local intelligence With degree of protection IP20	With degree of protection IP65/67	Modular controllers for system solutions in production automation in the low to mid-performance ranges
Product range	• 3 compact CPUs	• 3 standard CPUs • 2 fail-safe CPUs	• 1 standard CPU • 1 fail-safe CPU	• 7 standard CPUs • 7 compact CPUs • 5 fail-safe CPUs • 2 technology CPUs • 1 fail-safe technology CPU
Spare parts guaranteed for	10 years	10 years	10 years	10 years
Temperature range	0 ... 55 °C 1)	0 ... 60 °C 2)	0 ... 55 °C	0 ... 60 °C 2)
Performance				
Execution time for bit operation, min.	0.1 µs	0.06 µs	0.05 µs	0.004 µs (CPU 319)
Memory				
Main memory, max.	50 KB (CPU 1214C)	192 KB 5)	384 KB 6)	2 MB (CPU 319), 2.5 MB (CPU 319F)
Load memory/mass storage, max.	2 MB (CPU 1214C)	Micro Memory Card 8 MB		Micro Memory Card 8 MB
Backup, max.	2 KB	Program and data due to Micro Memory Card (maintenance-free)		Program and data due to Micro Memory Card (maintenance-free)
I/O devices				
I/O address area, max.	1024 / 1024 bytes	2048 / 2048 bytes	2048 / 2048 bytes	8192 / 8192 bytes
Centralized				
• I/O integrated in CPU	■			■ (compact CPU)
• I/O modules on CPU	■	■	■	■
Distributed				
• I/O modules on PROFIBUS	■	■	■	■
• I/O modules on PROFINET	■	■	■	■
Technology functions				
Loadable function blocks	■	■	■	■
Basic functions integrated in CPU	■			■ (compact CPU)
Special modules, plugged in centrally		■	■	■
Special technology controllers				■ (technology CPUs)
Isochronous mode		■	■	■
Safety / availability				
Fail-safety		■	■	■ (F-CPU)
Fault tolerance				
Configuration changes during operation (CiR)				
Connection / disconnection of centralized I/O during operation (hot swapping)		■		
HMI functions				
Integrated				
PC functions				
C/C++/C#/Visual Basic link				
Data acquisition and archiving	■			
Expandable with PC standard hardware				
Integration of PC standard HW/SW				
Engineering				
Configuration / programming software	STEP 7 Basic from V10.5/V11 in the TIA Portal, STEP 7 Professional from V11 in the TIA Portal			STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal
Programming languages	KOP, FUP, SCL			KOP (LD), FUP (FBD), AWL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiG
Configuration of integral HMI functions				
Communications				
MPI		■	■	■
PtP	■ (character-based serial comm.)			■ (also via CP)
AS-Interface	■ (via CP with STEP 7 V11 SP2)			■ (via CP)
PROFIBUS	■	■	■	■ (also via CP) 4)
PROFINET	■	■ (PN CPUs)	■	■ (also via CP)
Others integrated				
Web server		■ (PN CPUs)	■	■ (PN CPUs)

1) as SIPLUS component also for extended temperature range -40/-25 to +55/+70°C and corrosive atmosphere / condensation (www.siemens.com/siplus)
2) as 1), but temperature range -25 to +60°C

3) as SIPLUS component also for corrosive atmosphere / condensation (www.siemens.com/siplus-extreme)
4) with Technology CPU, additionally PROFIdrive
5) 256 KB with F version
6) 512 KB with F version

SIMATIC PC-based Controllers

S7-400	S7-1500	WinAC RTX (F)	S7 modular Embedded Controller	SIMATIC IPC227D bundles
	 NEW			
	S7-1500			
Modular controllers for system solutions in production and process automation in the medium to upper performance ranges	The modular controller for applications in the medium to upper performance range for discrete automation	57 controller as software controller for PC with Windows operating system (Windows XP, Windows Embedded Standard, Windows 7)	Embedded Controller in S7-300 design (fanless, diskless) with Windows Embedded Standard and software controller and HMI	Embedded rail-mounted PC (fanless, diskless) with Windows Embedded Standard, software controller and HMI
• 10 standard CPUs • 3 fail-safe CPUs • 4 fault-tolerant CPUs (also fail-safe)	• 3 standard CPUs • others coming soon	• 1 software controller WinAC RTX • 1 fail-safe variant WinAC RTX F (the first safety-related real-time software controller worldwide for Windows-based automation solutions up to SIL3, PL e, Cat. 4)	• PC-based controller in the following variants: - Pre-installed operating system - Plus WinAC RTX (F) - Plus HMI WinCC flexible/WinAC RTX • 1 fail-safe variant	• 1 hardware platform • fail-safe variant • 3 device versions with different expansion capabilities • Customized / OEM product on request
10 years 0 ... 60 °C 3)	10 years 0 ... 60 °C	PC-dependent	5 years 0 ... 50 °C	5 years 0 ... 55 °C
0.018 µs (CPU 417)	0.01 µs (CPU 1516)	0.004 µs (Pentium IV, 2.4 GHz, PC-dependent)	0.004 µs (Intel CoreDuo 1.2 GHz)	
30 MB (CPU 417)	6 MB (program 1 MB, data 5 MB)	PC main memory 2)	1 GB RAM	512 KB ... 2 GB RAM
Memory Card 64 MB Program and data due to backup-battery or Program due to MC EEPROM	2 GB (via Memory Card)	PC mass storage	4 GB CompactFlash card	2 / 4 / 8 / 16 GB CF card or 50 GB SSD (High Endurance) or 80 GB SSD (Standard)
16384 / 16384 bytes	32 / 32 KB	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes
	available soon			
■	■	■ 1)	■	■ (via PCIe, ODK)
■	■	■	■ (via CP 5603)	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■ (F / FH CPUs)	available soon	■	■	■
■ (H / FH CPUs)				
■	available soon			
■	available soon			
		■ (can be installed on PC)	■ (S7-mEC-HMI/RTX)	■ (bundle with WinCC RT Advanced)
		■ (via ODK)	■ (via ODK)	■ (via ODK)
		■ (very large volumes of data)	■ (large volumes of data)	■ (large volumes of data)
		■ (PC-dependent)	■ (4 PCI-104 cards max.)	■ (1 PCI-104 card max.)
		■ (via ODK, OPC)	■ (via ODK, OPC)	■ (via ODK, OPC)
A Portal	STEP 7 Professional from V12 in the TIA Portal			STEP 7 / STEP 7 Professional
graph, CFC	LAD (LD), FDB, STL (IL), S7-Graph (SFC), S7-SCL (ST)			LAD
			WinCC flexible (optional)	WinCC RT Advanced
■				
■ (via CP)	■ (via CMs)	■ (via CP distributed)	■ (via EM PC)	■ (via CP distributed)
■ (also via CP)	■	■ (via CP in PC)	■ (via CP 5603)	
■ (also via CP)	■	■ (via CP in PC)	■	■
		PC interfaces	Industrial Ethernet, USB	Industrial Ethernet, USB, RS232, DVI-D
■ (PN CPUs)	■	■ 5)	■ 5)	■ 5)

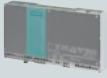
1) via PC cards and QDK

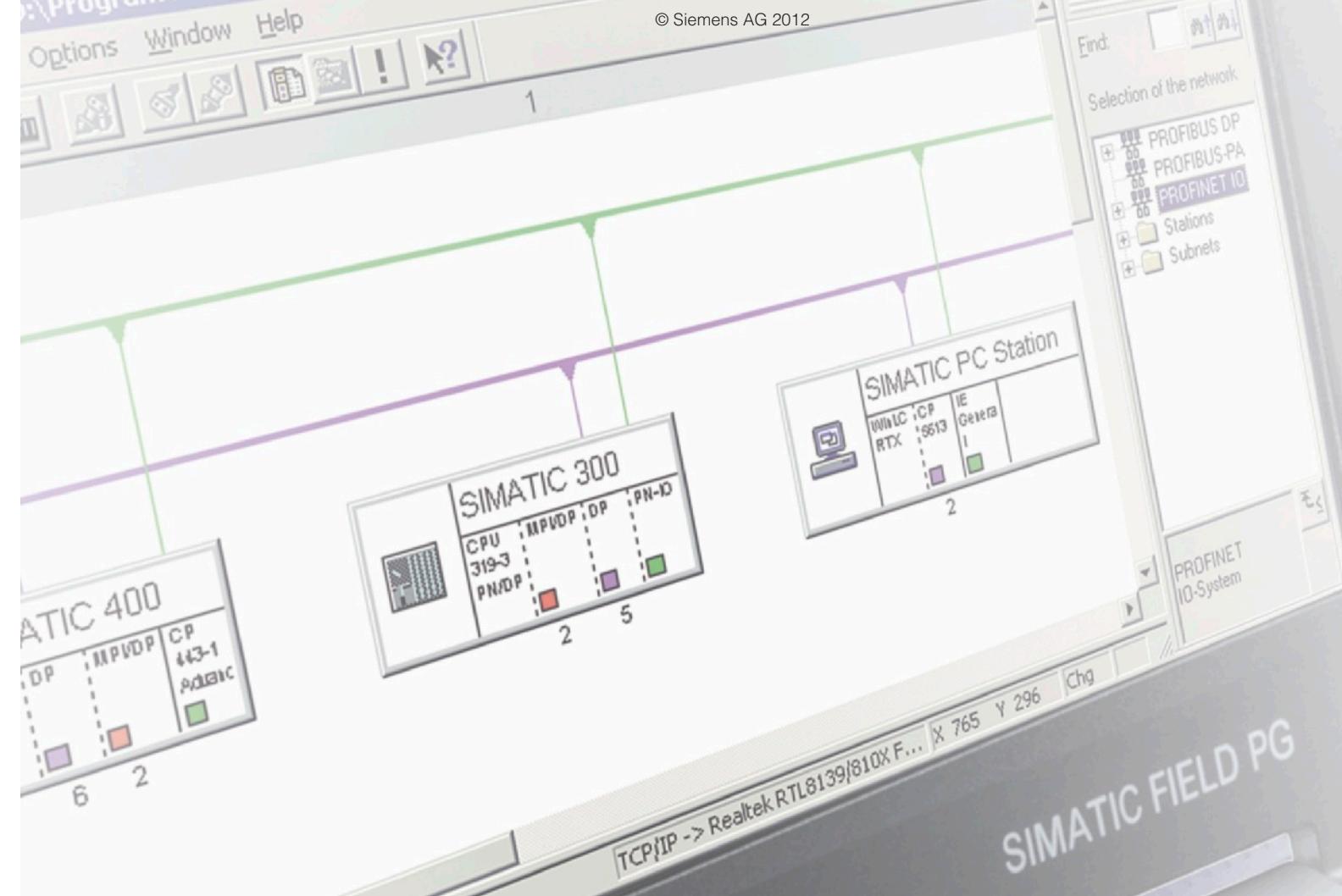
- 1) Via PCI cards and IDE
- 2) non-paged memory

3) 128 KB with specific SIMATIC PC without UPS

4) with F variant: S7 Distributed Safety, LAD, FBD for F programs
5) with WinAC RTX 2010

5) with WinAC RTX 2010

			Software Controllers for Multi Panels	
SIMATIC IPC427C bundles	SIMATIC HMI IPC277D bundles	SIMATIC HMI IPC477C bundles	WinAC MP 177/277/377	
				
Embedded rail-mounted PC (fanless, diskless) with Windows Embedded Standard, software controller and HMI	Embedded Panel PC (fanless, diskless) with Windows Embedded Standard, software controller and HMI	Embedded Panel PC (fanless, diskless) with Windows Embedded Standard, software controller and HMI	MP 177/277	MP 377
• 2 platforms (PROFINET, PROFIBUS), each with 3 software versions • 1 fail-safe variant • Customized / OEM product on request	• Panel PC with 7", 9", 12", 15" and 19" Touch • Customized design and OEM product on request • 1 fail-safe variant	• Panel PC, 12", 15" or 19" Touch or 12", 15" Key each with 3 software versions, bundle with IPC477C PRO all-round protection to IP 65 also available • Customized design and OEM product on request • 1 fail-safe variant	• 1 standard product for Multi Panels with 6" to 19" • Customized design and OEM product on request	Product range
5 years 0 ... 55 °C	5 years 0 ... 50 °C	5 years 0 ... 50 °C	10 years 0 ... 50 °C	Spare parts guaranteed for Temperature range
0.004 µs (Intel Core2Solo 1.2 GHz)		0.004 µs (Intel Core2Solo 1.2 GHz)		Execution time for bit operation, min.
Memory				
4 GB RAM	512 KB ... 2 GB RAM	4 GB RAM	128 KB / 256 KB	512 KB
4 / 8 / 16 GB CF card or 50 GB SSD (High Endurance) or 80 GB SSD (Standard)	4 / 8 / 16 GB CF card or 50 GB SSD (High Endurance) or 80 GB SSD (Standard)	4 / 8 / 16 GB CF card or 50 GB SSD (High Endurance) or 80 GB SSD (Standard)		Load memory/mass storage, max.
Control data (128 KB SRAM) without UPS, all data with UPS	Control data (128 KB MRAM) without UPS, all data with UPS	Control data (128 KB SRAM) without UPS, all data with UPS	Control data (64 KB / 128 KB MRAM)	Control data (256 KB MRAM)
I/O devices				
16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	2048 / 2048 bytes 4096 / 4096 bytes	8192 / 8192 bytes
■ (via PCI-104 cards and ODK)				Centralized - I/O integrated in CPU - I/O modules on CPU
■	■	■	■	Distributed - I/O modules on PROFIBUS - I/O modules on PROFINET
■	■	■	■	Technology functions
■	■	■	■	Loadable function blocks
■	■	■	■	Basic functions integrated in CPU
■	■	■	■	Special modules, plugged in centrally
■	■	■	■	Special technology controllers
■	■	■	■	Isochronous mode
Safety / availability				
■	■	■	■	Fail-safety
■	■	■	■	Fault tolerance
■	■	■	■	Configuration changes during operation (CiR)
■	■	■	■	Connection / disconnection of centralized I/O during operation (hot swapping)
HMI functions				
■ (bundle with WinCC flexible or WinCC RT Advanced or WinCC single-user station or client or WinCC RT Professional)	■ (bundle with WinCC RT Advanced)	■ (bundle with WinCC flexible or WinCC RT Advanced or WinCC single-user station or client or WinCC RT Professional)	■ (Multi Panel)	Integrated
■ (via ODK)	■ (via ODK)	■ (via ODK)		PC functions
■ (large volumes of data)	■ (large volumes of data)	■ (large volumes of data)	■	C/C++/C#/Visual Basic link
■ (3 PCI-104 cards max.)				Data acquisition and archiving
■ (via ODK, OPC)	■ (via ODK, OPC)	■ (via ODK, OPC)		Expandable with PC standard hardware
■ (bundle with WinCC flexible or WinCC RT Advanced or WinCC single-user station or client or WinCC RT Professional)				Integration of PC standard HW/SW
Engineering				
onal from V5.x, STEP 7 from V11 in the TIA Portal				Configuration / programming software
(LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)				Programming languages
WinCC flexible, WinCC RT Advanced (optional) WinCC, WinCC RT Professional	WinCC RT Advanced	WinCC flexible, WinCC RT Advanced (optional) WinCC, WinCC RT Professional	WinCC flexible Standard, Advanced	Configuration of integral HMI functions
Communications				
■ (via CP distributed)	■ (via CP distributed)	■ (via CP distributed)	■	MPI
■				PtP
■				AS-Interface
■		■	■	PROFIBUS
■		■	■	PROFINET
Industrial Ethernet, USB, RS232, DVI/VGA PROFINET (IRT)	Industrial Ethernet, USB	Industrial Ethernet, USB, RS232, DVI/VGA PROFINET (IRT)	Industrial Ethernet, USB, RS232	Others integrated
■ 5)	■ 5)	■ 5)		Web server



Get more information

SIMATIC Controllers:

www.siemens.com/simatic-controller

SIMATIC automation systems:

www.siemens.com/simatic

Totally Integrated Automation:

www.siemens.com/totally-integrated-automation

SIPLUS extreme – hardening and finishing:

www.siemens.com/sipplus-extreme

Service and Support:

www.siemens.com/automation/service&support

SIMATIC partners:

www.siemens.com/automation/partner

Information material available for downloading:

www.siemens.com/simatic/printmaterial

SIMATIC Guide Manuals:

www.siemens.com/simatic-docu

Industry Mall Internet ordering system:

www.siemens.com/industrymall

Siemens AG
Industry Sector
Industrial Automation Systems
Postfach 4848
90026 NÜRNBERG
GERMANY

Subject to change without prior notice
Order No.: 6ZB5310-0MT02-0BB2
MP.R1.AS.0000.14.3.02 / Dispo 26100
BR 1112 3. WÜ 10 En
Printed in Germany
© Siemens AG 2012

The information provided in this brochure contains descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. Availability and technical specifications are subject to change without notice.
All product designations may be trademarks or product names of Siemens AG or supplier companies whose use by third parties for their own purposes could violate the rights of the owners.