

SIMATIC Controllers

The innovative solution for all automation tasks



Overview • November 2007

simatic CONTROLLERS

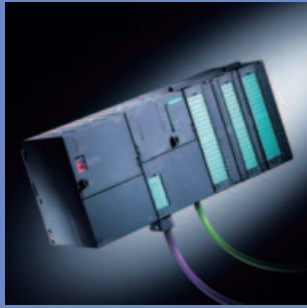


SIEMENS

SIMATIC Controllers

Integration in engineering, communication and diagnostics

Modular Controllers



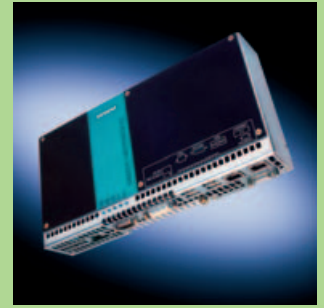
Your benefits

- Ready-to-use
- Long-term compatibility and availability
- Can be used in harsh environments
- Modular expandability and scalability
- Maintenance-free

Application areas

- Control
 - With centralized and distributed I/O
 - Technological tasks
 - Fault-tolerant
 - Fail-safe

Embedded Automation



Your benefits

- Ready-to-use
- Multifunctional
- Vibration-proof
- Low-maintenance
- Customized versions

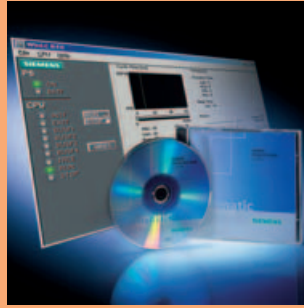
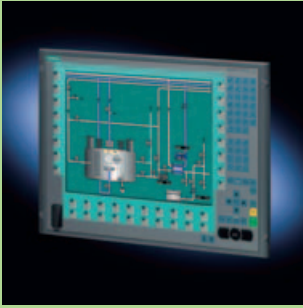
To be able to automate your machines and plants economically and flexibly, you need optimum solutions for every application area. Whether you want control "only", or you also want to implement other automation tasks such as operator control and monitoring, technology or data archiving – we always have the right solution for you! And we provide it with unique integration in engineering, communication and diagnostics.

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

Modular Controllers

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

PC-based Controllers



Application areas

- Control and
 - Operator control and monitoring
 - Technological tasks
 - Integration of user programs
 - Integration of C/C++ programs
 - Data exchange via OPC

Your benefits

- Flexible in use
- Open in hardware and software configuration
- Use of available PC resources
- Participation in constant PC innovations
- Customized PC versions

Application areas

- Control and
 - Visualization
 - Technological tasks
 - Data acquisition and archiving
 - Link to PC hardware and software
 - Integration of C/C++ programs
 - Data exchange via OPC

Embedded Automation



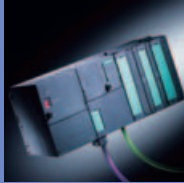


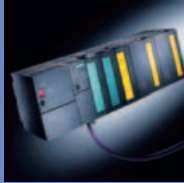




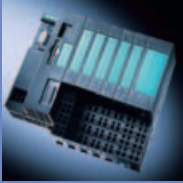



Embedded Automation products use the openness of PC-based systems and also offer an increased level of ruggedness. The controller, PC applications and the operator control and monitoring system, if required, run on a shared and rugged platform – without using rotating parts such as hard disks or fans. The operating system used is tailored and optimized to the hardware architecture in each case. The Embedded Automation products are ready-to-use and can be installed directly on DIN rails or at the machine on-site.

PC-based Controllers

PC-based Controllers can run on standard PC systems either as exclusively software PLCs or as slot PLCs in the form of a plug-in card. Any PC applications, operator control and monitoring tasks, control tasks and technological functions can all be easily combined into an overall automation solution. The extensive resources of an industrial PC, such as the work memory, are used for this purpose.

SIMATIC Controllers

The entire range at a glance

Modular Controllers				
Control	<p>S7-200</p> 	<p>ET 200 with CPU</p> 	<p>S7-300</p> 	<p>S7-400</p> 
Fail-safe control		<p>ET 200 with F-CPU</p> 	<p>S7-300 – F-CPU</p> 	<p>S7-400 – F-CPU</p> 
High-available or fault-tolerant control			<p>S7-300 with Software Redundancy</p> 	<p>S7-400 – H-CPU – FH-CPU</p> 
Control with technology functions	<p>S7-200</p> 	<p>ET 200S with technology modules</p> 	<p>S7-300 – Compact, T-CPU and FMs – Easy Motion Control</p> 	<p>S7-400 – e.g. FM 458-1DP – Easy Motion Control</p> 
Control, operator control and monitoring			<p>C7</p> 	
Control, operator control and monitoring and PC applications				

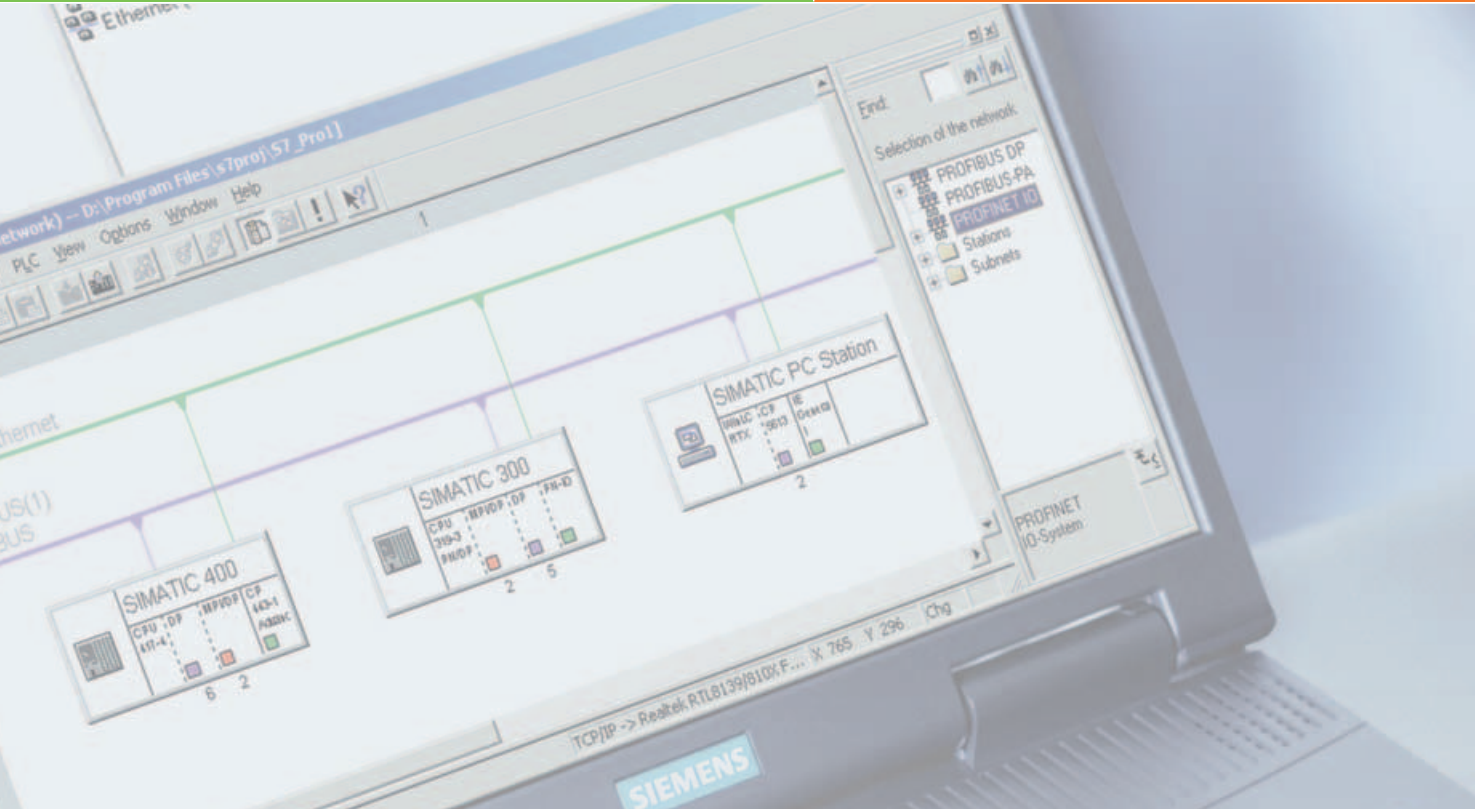
Totally Integrated Automation

SIMATIC Controllers are an essential component part of Totally Integrated Automation. The extensive product range enables 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 it is crucial to reduce engineering and startup costs.

Embedded Automation

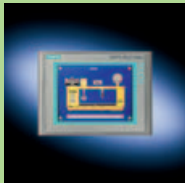
PC-based Controllers



Microbox 420-T



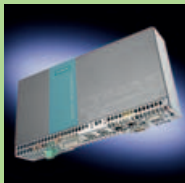
WinAC MP 277



WinAC MP 377



**Microbox 427B-RTX,
427B-HMI/RTX**



Panel PC 477B-HMI/RTX



WinAC Software PLC



WinAC Slot PLC



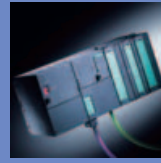
Selection assistance

Modular Controllers

S7-200



S7-300



S7-400



ET 200 mit CPU



C7



SIMATIC product/family

	S7-200	S7-300	S7-400	ET 200	ET 200pro	C7
Brief description	Modular micro-controllers for control tasks in the low-end performance range	Modular controllers for system solutions in manufacturing automation in the low to mid-performance range	Modular controllers for system solutions in manufacturing and process automation in the mid to high-end performance range	Distributed, bit-modular I/O system with local intelligence With degree of protection IP20	With degree of protection IP65/67	S7-300 controller and operator panel in one control unit
Range	– 5 compact CPUs	– 7 standard CPUs – 6 compact CPUs – 5 fail-safe CPUs – 2 technology CPUs	– 9 standard CPUs – 2 fail-safe CPUs – 3 fault-tolerant CPUs	– 1 standard CPU – 1 fail-safe CPU	– 1 standard CPU	– 5 versions (different CPU/panel combination) – Customized design on request
Spare parts guaranteed for	10 years	10 years	10 years	10 years		10 years
Temperature range	0...55 °C ¹⁾	0...60 °C ²⁾	0...60 °C ³⁾	0...60 °C ²⁾	0...55 °C	0...50 °C ³⁾
Performance						
Execution time for bit operation, min.	0.22 µs	0.01 µs (CPU 319)	0.018 µs (CPU 417)	0.1 µs		0.1 µs
Memory				ET 200S	ET 200pro	
Main memory, max.	Program 24 KB, Data 10 KB	1400 KB (CPU 319)	30 MB (CPU 417)	96 KB	256 KB	128 KB
Load memory/mass storage, max.	Memory cassette 256 KB	Micro Memory Card 8 MB	Memory Card 64 MB	Micro Memory Card 8 MB		Micro Memory Card 8 MB
Backup, max.	Program on EEPROM, dynamic data on integral capacitor or optionally on battery module	Program and data on Micro Memory Card (maintenance-free)	Program and data on battery module	Program and data on Micro Memory Card (maintenance-free)		Program and data on micro memory card (maintenance-free)
I/O						
I/O address area, max.	128 / 120 digital 30 / 15 analog	8192 / 8192 byte	16384 / 16384 byte	244 / 244 byte	2048 / 2048 byte	2048 / 2048 byte
Central I/O integrated in CPU	■	■ (compact CPU)	■	■		■
Distributed I/O modules on PROFIBUS						
I/O modules on PROFINET		ET 200S, ET 200pro	ET 200S, ET 200pro			ET 200S, ET 200pro (via CP)
Technological functions						
Loadable function blocks	■	■	■	■		■
Basic functions integrated into CPU	■	■ (compact CPUs)				■
Special modules, plugged in centrally	■	■	■	■		■
Special technology controllers		■ (technology CPUs)				
Isochronous mode		■	■			
Safety/availability				ET 200S	ET 200pro	
Fail-safety		■ (F-CPU)	■ (F-CPU / FH-CPU)	■		
Fault tolerance		■ (software redundancy)	■ (H/ FH CPU or software redundancy)			■ (software redundancy)
Configuration changes during operation (CIR)			■			
Connection/disconnection of centralized I/O during operation (hot swapping)			■			
HMI functions						
Integrated						■ (Touch Panel or Operator Panel)
PC functions						
Interfacing of C/++						
Data acquisition and archiving						
Expandable with PC standard hardware						
Integration of PC standard hardware/software						
Engineering						
Configuring/programming software	STEP 7 Micro/WIN					
Programming languages	LD, FBD, IL					
Configuring of integrated HMI functions						WinCC flexible (C7-613: STEP 7)
Communication						
MPI	■	■	■	■	■	■
PtP	■ (Freeport)	■ (also via CP)	■ (via CP)			■ (via CP)
AS-Interface	■ (via CP)	■ (via CP)				■ (via CP)
PROFIBUS	■ (via CP as DP-Slave)	■ ⁴⁾ (also via CP)	■ (also via CP)	■	■	■ (also via CP)
PROFINET		■ (also via CP)	■ (also via CP)		■	■ (via CP)
Others integrated	Freeport, PPI, via CP: Ind. Ethernet					
Web-Server		■ (PN-CPU)	■ (PN-CPU)		■	

¹⁾ with SIPLUS components, also for extended temperature range -25...+70°C and aggressive atmosphere/condensation (www.siemens.com/siplus)

²⁾ as ¹⁾, but temperature range -25...+60°C

³⁾ with SIPLUS components also for aggressive atmosphere/condensation (www.siemens.com/siplus)

⁴⁾ with Technology CPU, additionally PROFIDrive

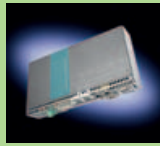
Embedded Automation

PC-based Controllers

WinAC MP 277/377



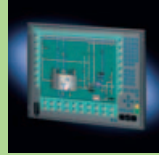
Microbox 427B-RTX, 427B-HMI/RTX



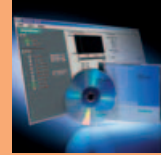
Microbox 420-T



Panel PC 477B-HMI/RTX



WinAC Software PLC



WinAC Slot PLC



MP 277 **MP 377**

Software PLC on multifunctional platform (fan-free, hard-disk-free) with Windows CE

Embedded DIN rail PC (fan-free, hard-disk-free) with Windows XP Embedded and software PLC

Embedded rail-mounted PC (fan-free hard-disk-free) with Windows XP Embedded, software PLC and technological functions

Embedded Panel PC (fan-free, hard-disk-free) with Windows XP Embedded, software PLC and HMI

S7 controller as software PLC for the PC with Windows operating system and real-time expansion

S7 controller as PCI plug-in card for the PC with Windows operating system

- Standard product
- Customized design and OEM product on request

- Standard product
- Customized OEM product on request

- Standard product
- Customized OEM product on request

- Panel PC with 12", 15" or 19", key or touch
- Customized design and OEM product on request

- 1 software PLC

- 2 slot PLCs

10 years

5 years

5 years

5 years

5 years

0...50 °C

0...50 °C

0...50 °C

5...45 °C

PC dependent

PC dependent

0,02 µs (Celeron M 1 GHz)

0.01 µs (PIII 933 MHz)

0.01 µs (Celeron M 1 GHz)

0.004 µs (Pentium IV, 2.4 GHz)

0.04 µs (WinAC Slot 416)

256 kB

512 kB

1 GB RAM

512 MB RAM

1 GB RAM

Available PC main memory

3.2 MB

2 or 4 GB compact flash card

1 GB compact flash card

1, 2 or 4 GB compact flash card

Dependent on PC mass memory

Memory Card 64 MB

All data with UPS

Controller data (128 kB SRAM) without UPS, all data with UPS

Controller data (30kB SRAM) without UPS, all data with UPS

Controller data (128 kB SRAM) without UPS, all data with UPS

All data with UPS

All data with power pack expansion board

4096 / 4096 byte

8192 / 8192 byte

16384 / 16384 byte

2048 / 2048 byte

16384 / 16384 byte

16384 / 16384 byte

16384 / 16384 byte

■ (via PCI-104 cards and ODK)

■ (8 DA)

■ (via PCI-104 cards and ODK)

■ ²⁾

■ ²⁾

All ET 200 I/O devices

■

■

■

■

■

■

■

■

■

■ (with CP 5613)

■

■ (software redundancy)

■ (software redundancy)

■ (Multipanel)

■ (Microbox 427B-HMI/RTX)

■

■ (can be installed on PC)

■ (can be installed on PC)

■ (via ODK)

■ (via ODK)

■ (via ODK)

■ (via ODK)

■ (via ODK)

■ (Large data volumes)

■ (Large data volumes)

■ (Large data volumes)

■ (Extremely large data volumes)

■ (Extremely large data volumes)

■ (max. 3 x PCI-104 cards)

■ (max. 3 x PCI-104 cards)

■ (PC-dependent)

■ (PC-dependent)

■ (via ODK, OPC)

■ (via ODK, OPC)

■ (via ODK, OPC)

■ (via ODK, OPC)

■ (via ODK, OPC)

STEP 7 / STEP 7 Professional

LD, FBD, IL, SCL (ST), S7-Graph (SFC), S7-HiGraph, CFC

WinCC flexible Standard, Advanced

WinCC flexible (optional)

WinCC flexible

■

■ (via CP distributed)

■ (via CP distributed)

■ (via CP distributed)

■ (via CP distributed)

■ (via CP distributed)

■

■

■¹⁾

■

■ (via CP in PC)

■

Ind. Ethernet, USB, RS232

Ind. Ethernet, USB, RS232, DVI-I

Ind. Ethernet, USB, RS232, DVI-I

Ind. Ethernet, USB, RS232, DVI/VGA

PC interfaces

PC interfaces

¹⁾ for Microbox 420-T additionally PROFIdrive

²⁾ via PC-cards and ODK

Interested?

You can get more information on the Internet

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 - Ruggedizing and Refining

www.siemens.com/siplus

Service und Support

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