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# SIMATIC Controllers

The innovative solution for all automation tasks

SIMATIC

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Subject to change without prior notice  
Order No.: 6ZB5310-0MT02-0BB3  
MP.R1.AS.0000.14.3.07 / Dispo 26100  
BR 0413 3. SB 10 En  
Printed in Germany  
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Overview

Edition  
April 2013

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++/IC# programs
- Data exchange via OPC
- Fail-safe control

#### SIMATIC PC-based Controllers

SIMATIC PC-based Controllers use the real-time-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

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	SIMATIC Modulare Controllers					SIMATIC PC-based Controllers		Software Controllers for Multi Panels		
Control	S7-1200  <a href="http://www.siemens.com/s7-1200">www.siemens.com/s7-1200</a>	ET 200 with CPU  <a href="http://www.siemens.com/et200">www.siemens.com/et200</a>	S7-300  <a href="http://www.siemens.com/s7-300">www.siemens.com/s7-300</a>	S7-400  <a href="http://www.siemens.com/s7-400">www.siemens.com/s7-400</a>	S7-1500  <a href="http://www.siemens.com/s7-1500">www.siemens.com/s7-1500</a>	WinAC RTX  <a href="http://www.siemens.com/winac">www.siemens.com/winac</a>				
Controlling with technology functions	S7-1200  <a href="http://www.siemens.com/s7-1200">www.siemens.com/s7-1200</a>	ET 200  <a href="http://www.siemens.com/et200">www.siemens.com/et200</a>	S7-300 with Easy Motion Control or technology CPU (optionally with Safety)  <a href="http://www.siemens.com/s7-300">www.siemens.com/s7-300</a>	S7-400 with FM 458  <a href="http://www.siemens.com/s7-400">www.siemens.com/s7-400</a>	S7-1500  <a href="http://www.siemens.com/s7-1500">www.siemens.com/s7-1500</a>	WinAC RTX with Easy Motion Control  <a href="http://www.siemens.com/winac">www.siemens.com/winac</a>	Customized functions with WinAC ODK  <a href="http://www.siemens.com/winac-odk">www.siemens.com/winac-odk</a>			
Fail-safe control		ET 200 with F-CPU  <a href="http://www.siemens.com/et200">www.siemens.com/et200</a>	S7-300 with F-CPU  <a href="http://www.siemens.com/s7-300">www.siemens.com/s7-300</a>	S7-400 with F-CPU  <a href="http://www.siemens.com/s7-400">www.siemens.com/s7-400</a>	S7-1500 with F-CPU  <a href="http://www.siemens.com/s7-1500">www.siemens.com/s7-1500</a>	WinAC RTX F  <a href="http://www.siemens.com/winac-rtx-f">www.siemens.com/winac-rtx-f</a>	S7-mEC-RTX F  <a href="http://www.siemens.com/s7-mec">www.siemens.com/s7-mec</a>	Embedded bundles with WinAC RTX F  <a href="http://www.siemens.com/embedded-automation">www.siemens.com/embedded-automation</a>		
Fault-tolerant control				S7-400 H-System optionally with Safety  <a href="http://www.siemens.com/s7-400h">www.siemens.com/s7-400h</a>						
Control, operator control and monitoring						S7 Modular Embedded Controller  <a href="http://www.siemens.com/s7-mec">www.siemens.com/s7-mec</a>	IPC227D/IPC427C bundles with WinAC RTX (F) and HMI-Software  <a href="http://www.siemens.com/ipc227d">www.siemens.com/ipc227d</a>	HMI IPC277D/IPC477C bundles with WinAC RTX (F) and HMI-Software  <a href="http://www.siemens.com/ipc277d">www.siemens.com/ipc277d</a>	WinAC MP 177/277 	WinAC MP 377 

# SIMATIC Controllers

## The complete range at a glance

### Totally Integrated Automation

Totally Integrated Automation stands for Industrial Automation from Siemens and encompasses the entire production process. The open system structure incorporates hardware and software sharing the same properties: Consistent data management, world-wide standards, and uniform interfaces. The resulting responsiveness increases

efficiency and productivity. 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 Modulare Controllers					SIMATIC PC-based Controllers		Software Controllers for Multi Panels		
Control	S7-1200  <a href="http://www.siemens.com/s7-1200">www.siemens.com/s7-1200</a>	ET 200 with CPU  <a href="http://www.siemens.com/et200">www.siemens.com/et200</a>	S7-300  <a href="http://www.siemens.com/s7-300">www.siemens.com/s7-300</a>	S7-400  <a href="http://www.siemens.com/s7-400">www.siemens.com/s7-400</a>	S7-1500  <a href="http://www.siemens.com/s7-1500">www.siemens.com/s7-1500</a>	WinAC RTX  <a href="http://www.siemens.com/winac">www.siemens.com/winac</a>				
Controlling with technology functions	S7-1200  <a href="http://www.siemens.com/s7-1200">www.siemens.com/s7-1200</a>	ET 200  <a href="http://www.siemens.com/et200">www.siemens.com/et200</a>	S7-300 with Easy Motion Control or technology CPU (optionally with Safety)  <a href="http://www.siemens.com/s7-300">www.siemens.com/s7-300</a>	S7-400 with FM 458  <a href="http://www.siemens.com/s7-400">www.siemens.com/s7-400</a>	S7-1500  <a href="http://www.siemens.com/s7-1500">www.siemens.com/s7-1500</a>	WinAC RTX with Easy Motion Control  <a href="http://www.siemens.com/winac">www.siemens.com/winac</a>	Customized functions with WinAC ODK  <a href="http://www.siemens.com/winac-odk">www.siemens.com/winac-odk</a>			
Fail-safe control	ET 200 with F-CPU  <a href="http://www.siemens.com/et200">www.siemens.com/et200</a>		S7-300 with F-CPU  <a href="http://www.siemens.com/s7-300">www.siemens.com/s7-300</a>	S7-400 with F-CPU  <a href="http://www.siemens.com/s7-400">www.siemens.com/s7-400</a>	S7-1500 with F-CPU  <a href="http://www.siemens.com/s7-1500">www.siemens.com/s7-1500</a>	WinAC RTX F  <a href="http://www.siemens.com/winac-rtx-f">www.siemens.com/winac-rtx-f</a>	S7-mEC-RTX F  <a href="http://www.siemens.com/s7-mec">www.siemens.com/s7-mec</a>	Embedded bundles with WinAC RTX F  <a href="http://www.siemens.com/embedded-automation">www.siemens.com/embedded-automation</a>		
Fault-tolerant control				S7-400 H-System optionally with Safety  <a href="http://www.siemens.com/s7-400h">www.siemens.com/s7-400h</a>						
Control, operator control and monitoring						S7 Modular Embedded Controller  <a href="http://www.siemens.com/s7-mec">www.siemens.com/s7-mec</a>	IPC227D/IPC427C bundles with WinAC RTX (F) and HMI-Software  <a href="http://www.siemens.com/ipc227d">www.siemens.com/ipc227d</a>	HMI IPC277D/IPC477C bundles with WinAC RTX (F) and HMI-Software  <a href="http://www.siemens.com/ipc277d">www.siemens.com/ipc277d</a>	WinAC MP 177/277 	WinAC MP 377 

# Selection guide

SIMATIC Modulare Controllers						SIMATIC PC-based Controllers						Software Controllers for Multi Panels			
57-1200	ET 200 with CPU		S7-300	S7-400	S7-1500	WinAC RTX (F)	S7 modular Embedded Controller	SIMATIC IPC227D bundles	SIMATIC IPC427C bundles	SIMATIC HMI IPC277D bundles	SIMATIC HMI IPC477C bundles	WinAC MP 177/277/377			
<b>SIMATIC product/family</b>	<b>ET 200S</b>		<b>ET 200pro</b>		<b>S7-1500</b>	<b>WinAC RTX (F)</b>	<b>S7 modular Embedded Controller</b>	<b>SIMATIC IPC227D bundles</b>	<b>SIMATIC IPC427C bundles</b>	<b>SIMATIC HMI IPC277D bundles</b>	<b>SIMATIC HMI IPC477C bundles</b>	<b>MP 177/277</b>	<b>MP 377</b>	<b>SIMATIC product/family</b>	
<b>Product Brief</b>	Modular, compact controller for discrete and stand-alone automation solutions		Distributed, discretely-modular I/O system with local intelligence		Modular controllers for system solutions in production automation in the low to mid-performance ranges	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	S7 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	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	Software controllers for Multi Panels	Product Brief
<b>Product range</b>	• 5 compact CPUs		With degree of protection IP65/67 • 1 standard CPU • 2 fail-safe CPUs		• 7 standard CPUs • 7 compact CPUs • 5 fail-safe CPUs • 2 technology CPUs • 1 fail-safe technology CPU	• 10 standard CPUs • 3 fail-safe CPUs • 4 fault-tolerant CPUs (also fail-safe)	• 3 standard CPUs with display (diagonal up to 6.1 cm) • 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	• 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
<b>Spare parts guaranteed for</b>	10 years		10 years		10 years	10 years	10 years	10 years	5 years	5 years	5 years	5 years	5 years	10 years	Spare parts guaranteed for
<b>Temperature range</b>	-20 ... 60 °C 1)		0 ... 55 °C		0 ... 60 °C 2)	0 ... 60 °C 3)	0 ... 60 °C	0 ... 60 °C	0 ... 55 °C	0 ... 55 °C	0 ... 55 °C	0 ... 50 °C	0 ... 50 °C	0 ... 50 °C	Temperature range
<b>Performance</b>	Execution time for bit operation, min.														
<b>Memory</b>	Main memory, max.														
<b>I/O devices</b>	I/O address area, max.														
<b>Technology functions</b>	Loadable function blocks														
<b>Safety / availability</b>	Fail-safety														
<b>HMI functions</b>	Integrated														
<b>PC functions</b>	C/C++/C#/Visual Basic link														
<b>Engineering</b>	Configuration / programming software														
<b>Communications</b>	MPI														

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) 1.5 MB with F version  
 7) also TF-CPU with PROFINET

# Selection guide

SIMATIC Modulare Controllers					SIMATIC PC-based Controllers							Software Controllers for Multi Panels				
S7-1200	ET 200 with CPU		S7-300	S7-400	S7-1500	WinAC RTX (F)	S7 modular Embedded Controller	SIMATIC IPC227D bundles	SIMATIC IPC427C bundles	SIMATIC HMI IPC277D bundles	SIMATIC HMI IPC477C bundles	WinAC MP 177/277/377				
																
<b>SIMATIC product/family</b>	<b>ET 200S</b>		<b>ET 200pro</b>									<b>MP 177/277</b>	<b>MP 377</b>	<b>SIMATIC product/family</b>		
<b>Product Brief</b>	Modular, compact controller for discrete and stand-alone automation solutions		Distributed, discretely-modular I/O system with local intelligence	Modular controllers for system solutions in production automation in the low to mid-performance ranges	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	S7 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	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	Software controllers for Multi Panels	Product Brief		
<b>Product range</b>	• 5 compact CPUs		With degree of protection IP20 • 3 standard CPUs • 2 fail-safe CPUs	With degree of protection IP65/67 • 1 standard CPU • 2 fail-safe CPUs	• 7 standard CPUs • 7 compact CPUs • 5 fail-safe CPUs • 2 technology CPUs • 1 fail-safe technology CPU	• 10 standard CPUs • 3 fail-safe CPUs • 4 fault-tolerant CPUs (also fail-safe)	• 3 standard CPUs with display (diagonal up to 6.1 cm) • 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	• 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		
<b>Spare parts guaranteed for</b>	10 years		10 years	10 years	10 years	10 years	10 years	5 years	5 years	5 years	5 years	10 years	10 years	<b>Spare parts guaranteed for</b>		
<b>Temperature range</b>	-20 ... 60 °C 1)		0 ... 60 °C 2)	0 ... 55 °C	0 ... 60 °C 2)	0 ... 60 °C 3)	0 ... 60 °C	0 ... 50 °C	0 ... 55 °C	0 ... 50 °C	0 ... 50 °C	0 ... 50 °C	0 ... 50 °C	<b>Temperature range</b>		
<b>Performance</b>	0.085 µs		0.06 µs	0.025 µs (IM154-8FX)	0.004 µs (CPU 319)	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)	0.004 µs (Intel Core2Solo 1.2 GHz)	0.004 µs (Intel Core2Solo 1.2 GHz)	0.004 µs (Intel Core2Solo 1.2 GHz)	0.004 µs (Intel Core2Solo 1.2 GHz)	<b>Performance</b>		
<b>Execution time for bit operation, min.</b>	0.085 µs		0.06 µs	0.025 µs (IM154-8FX)	0.004 µs (CPU 319)	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)	0.004 µs (Intel Core2Solo 1.2 GHz)	0.004 µs (Intel Core2Solo 1.2 GHz)	0.004 µs (Intel Core2Solo 1.2 GHz)	0.004 µs (Intel Core2Solo 1.2 GHz)	<b>Execution time for bit operation, min.</b>		
<b>Memory</b>	125 KB (CPU 1217C)		192 KB 5)	512 KB 6)	2 MB (CPU 319), 2.5 MB (CPU 319F)	30 MB (CPU 417)	6 MB (program 1 MB, data 5 MB)	PC main memory 2)	1 GB RAM	512 KB ... 2 GB RAM	4 GB RAM	512 KB ... 2 GB RAM	4 GB RAM	128 KB / 256 KB	512 KB	
<b>Main memory, max.</b>	125 KB (CPU 1217C)		192 KB 5)	512 KB 6)	2 MB (CPU 319), 2.5 MB (CPU 319F)	30 MB (CPU 417)	6 MB (program 1 MB, data 5 MB)	PC main memory 2)	1 GB RAM	512 KB ... 2 GB RAM	4 GB RAM	512 KB ... 2 GB RAM	4 GB RAM	128 KB / 256 KB	512 KB	
<b>Load memory/mass storage, max.</b>	4 MB (CPU 1217C)		Micro Memory Card	Micro Memory Card	Micro Memory Card	Memory Card	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)	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)	Control data (64 KB / 128 KB MRAM)	Control data (256 KB MRAM)	
<b>Backup, max.</b>	Program and data due to SIMATIC Memory Card (maintenance-free)		8 MB Program and data due to Micro Memory Card (maintenance-free)	8 MB Program and data due to Micro Memory Card (maintenance-free)	8 MB Program and data due to Micro Memory Card (maintenance-free)	Program and data due to backup-battery or Program due to MC EEPROM	Program and data due to SIMATIC Memory Card (maintenance-free)	All data with UPS 3)	Control data (512 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 (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)	
<b>I/O devices</b>	1024 / 1024 bytes		2048 / 2048 bytes	2048 / 2048 bytes	8192 / 8192 bytes	16384 / 16384 bytes	32 / 32 KB	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	2048 / 2048 bytes	8192 / 8192 bytes	
<b>I/O address area, max.</b>	1024 / 1024 bytes		2048 / 2048 bytes	2048 / 2048 bytes	8192 / 8192 bytes	16384 / 16384 bytes	32 / 32 KB	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	16384 / 16384 bytes	2048 / 2048 bytes	8192 / 8192 bytes	
<b>Centralized</b>	■		■	■	■ (compact CPU)	■	■	■ 1)	■	■ (via PCIe, ODK)	■	■ (via PCI-104 cards and ODK)	■	■	■	
<b>I/O integrated in CPU</b>	■		■	■	■ (compact CPU)	■	■	■	■	■	■	■	■	■	■	
<b>I/O modules on CPU</b>	■		■	■	■	■	■	■	■	■	■	■	■	■	■	
<b>Distributed</b>	■		■	■	■	■	■	■	■ (via CP 5603)	■	■	■	■	■	■	
<b>I/O modules on PROFIBUS</b>	■		■	■	■	■	■	■	■	■	■	■	■	■	■	
<b>I/O modules on PROFINET</b>	■		■	■	■	■	■	■	■	■	■	■	■	■	■	
<b>Technology functions</b>	■		■	■	■ (compact CPU)	■	■	■	■	■	■	■	■	■	■	
<b>Loadable function blocks</b>	■		■	■	■ (compact CPU)	■	■	■	■	■	■	■	■	■	■	
<b>Basic functions integrated in CPU</b>	■		■	■	■ (compact CPU)	■	■	■	■	■	■	■	■	■	■	
<b>Special modules, plugged in centrally</b>	■		■	■	■ (technology CPUs 7)	■	■	■	■	■	■	■	■	■	■	
<b>Special technology controllers</b>	■		■	■	■ (technology CPUs 7)	■	■	■	■	■	■	■	■	■	■	
<b>Isochronous mode</b>	■		■ (PN-CPU)	■	■	■	■	■	■	■	■	■	■	■	■	
<b>Safety / availability</b>	available soon		■ (F-CPU)	■ (F-CPU)	■ (F-CPU) 7)	■ (F / FH CPUs)	available soon	■	■	■	■	■	■	■	■	
<b>Fail-safety</b>	available soon		■ (F-CPU)	■ (F-CPU)	■ (F-CPU) 7)	■ (F / FH CPUs)	available soon	■	■	■	■	■	■	■	■	
<b>Fault tolerance</b>	available soon		■ (F-CPU)	■ (F-CPU)	■ (F-CPU) 7)	■ (H / FH CPUs)	available soon	■	■	■	■	■	■	■	■	
<b>Configuration changes during operation (CIR)</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>Connection / disconnection of centralized I/O during operation (hot swapping)</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>HMI functions</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>Integrated</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>PC functions</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>C/C++/C#/Visual Basic link</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>Data acquisition and archiving</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>Expandable with PC standard hardware</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>Integration of PC standard HW/SW</b>	available soon		■	■	■	■	available soon	■	■	■	■	■	■	■	■	
<b>Engineering</b>	STEP 7 Basic V12 in the TIA Portal, STEP 7 Professional V12 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 Professional from V12 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal	
<b>Configuration / programming software</b>	STEP 7 Basic V12 in the TIA Portal, STEP 7 Professional V12 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 Professional from V12 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal	
<b>Programming languages</b>	KOP, FUP, SCL		KOP (LD), FUP (FBD), AWL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC		LAD (LD), FDB, STL (IL), S7-Graph (SFC) available soon, S7-SCL (ST)		LAD (LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)		LAD (LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)		LAD (LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)		LAD (LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)		LAD (LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)	
<b>Configuration of integral HMI functions</b>	WinCC flexible (optional)		WinCC RT Advanced		WinCC flexible (optional)		WinCC flexible (optional)		WinCC flexible (optional)		WinCC flexible (optional)		WinCC flexible (optional)		WinCC flexible (optional)	
<b>Communications</b>	WinCC flexible (optional)		WinCC RT Advanced		WinCC flexible (optional)		WinCC flexible (optional)		WinCC flexible (optional)		WinCC flexible (optional)		WinCC flexible (optional)		WinCC flexible (optional)	
<b>MPI</b>	■		■	■	■	■	■	■	■	■	■	■	■	■	■	
<b>PTP</b>	■ (character-based serial comm.)		■	■	■ (also via CP)	■ (via CP)	■ (via CMs)	■ (via CP distributed)	■ (via EM PC)	■ (via CP distributed)	■ (via CP distributed)	■ (via CP distributed)	■ (via CP distributed)	■ (via CP distributed)	■	
<b>AS-Interface</b>	■ (via CP with STEP 7 V11 SP2)		■	■	■ (via CP)	■	■	■ (via CP in PC)	■ (via CP 5603)	■	■	■	■	■	■	
<b>PROFIBUS</b>	■		■	■	■ (also via CP 4)	■	■	■ (via CP in PC)	■	■	■	■	■	■	■	
<b>PROFINET IO</b>	■		■ (PN CPUs)	■	■ (also via CP)	■	■	■ (via CP in PC)	■	■	■	■	■	■	■	
<b>Others integrated</b>	■		■	■	■	■	■	■	■	■	■	■	■	■	■	
<b>Web server</b>	■ (Smart Device Access, SIMATIC S7-1200 App)		■ (PN CPUs)	■	■ (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  
 4) with Technology CPU, additionally PROFIDrive  
 5) 256 KB with F version  
 6) 1.5 MB with F version  
 7) also TF-CPU with PROFINET

1) via PC cards and ODK  
 2) non-paged memory  
 3) 128 KB with specific SIMATIC PC without UPS  
 4) with F variant: S7 Distributed Safety, LAD, FBD for F program  
 5) with WinAC RTX 2010

# Selection guide

SIMATIC Modulare Controllers						SIMATIC PC-based Controllers						Software Controllers for Multi Panels		
S7-1200	ET 200 with CPU		S7-300	S7-400	S7-1500	WinAC RTX (F)	S7 modular Embedded Controller	SIMATIC IPC227D bundles	SIMATIC IPC427C bundles	SIMATIC HMI IPC277D bundles	SIMATIC HMI IPC477C bundles	WinAC MP 177/277/377		
<b>SIMATIC product/family</b>	<b>ET 200S</b>		<b>ET 200pro</b>		<b>S7-1500</b>		<b>S7-1500</b>		<b>S7-1500</b>		<b>S7-1500</b>		<b>S7-1500</b>	
<b>Product Brief</b>	Modular, compact controller for discrete and stand-alone automation solutions		Distributed, discretely-modular I/O system with local intelligence		Modular controllers for system solutions in production automation in the low to mid-performance ranges		Modular controllers for system solutions in production and process automation in the medium to upper performance ranges for discrete automation		The modular controller for applications in the medium to upper performance range for discrete automation		S7 controller as software controller for PC with Windows operating system (Windows XP, Windows Embedded Standard, Windows 7)		S7 controller as software controller for PC with Windows operating system (Windows XP, Windows Embedded Standard, Windows 7)	
<b>Product range</b>	• 5 compact CPUs		With degree of protection IP20 • 3 standard CPUs • 2 fail-safe CPUs		With degree of protection IP65/67 • 1 standard CPU • 2 fail-safe CPUs		• 7 standard CPUs • 7 compact CPUs • 5 fail-safe CPUs • 2 technology CPUs • 1 fail-safe technology CPU		• 10 standard CPUs • 3 fail-safe CPUs • 4 fault-tolerant CPUs (also fail-safe)		• 3 standard CPUs with display (diagonal up to 6.1 cm) • 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)	
<b>Spare parts guaranteed for</b>	10 years		10 years		10 years		10 years		10 years		10 years		10 years	
<b>Temperature range</b>	-20 ... 60 °C 1)		0 ... 60 °C 2)		0 ... 55 °C		0 ... 60 °C 2)		0 ... 55 °C 3)		0 ... 60 °C		0 ... 55 °C	
<b>Performance</b>	Execution time for bit operation, min.		0.085 µs		0.06 µs		0.025 µs (IM154-8FX)		0.004 µs (CPU 319)		0.018 µs (CPU 417)		0.01 µs (CPU 1516)	
<b>Memory</b>	Main memory, max.		125 KB (CPU 1217C)		192 KB 5)		512 KB 6)		2 MB (CPU 319), 2.5 MB (CPU 319F)		30 MB (CPU 417)		6 MB (program 1 MB, data 5 MB)	
<b>Load memory/mass storage, max.</b>	4 MB (CPU 1217C)		Micro Memory Card 8 MB		Micro Memory Card 8 MB		Memory Card 64 MB		2 GB (via Memory Card)		2 GB (via Memory Card)		PC main memory 2)	
<b>Backup, max.</b>	Program and data due to SIMATIC Memory Card (maintenance-free)		Program and data due to SIMATIC Memory Card (maintenance-free)		Program and data due to Micro Memory Card (maintenance-free)		Program and data due to Micro Memory Card (maintenance-free)		Program and data due to backup-battery or Program due to MC EEPROM		Program and data due to SIMATIC Memory Card (maintenance-free)		All data with UPS 3)	
<b>I/O devices</b>	I/O address area, max.		1024 / 1024 bytes		2048 / 2048 bytes		2048 / 2048 bytes		8192 / 8192 bytes		16384 / 16384 bytes		32 / 32 KB	
<b>Centralized</b>	I/O integrated in CPU		■		■		■ (compact CPU)		■		■		available soon	
<b>Distributed</b>	I/O modules on CPU		■		■		■		■		■		■ 1)	
<b>Distributed</b>	I/O modules on PROFIBUS		■		■		■		■		■		■ (via CP 5603)	
<b>Distributed</b>	I/O modules on PROFINET		■		■		■		■		■		■	
<b>Technology functions</b>	Loadable function blocks		■		■		■		■		■		■	
<b>Basic functions integrated in CPU</b>	■		■		■		■ (compact CPU)		■		■		■	
<b>Special modules, plugged in centrally</b>	■		■		■		■		■		■		■	
<b>Special technology controllers</b>	■		■		■		■ (technology CPUs 7)		■		■		■	
<b>Isynchronous mode</b>	■		■ (PN-CPU)		■		■		■		■		■	
<b>Safety / availability</b>	Fail-safety		available soon		■ (F-CPU)		■ (F-CPU)		■ (F-CPU) 7)		■ (F / FH CPU)		available soon	
<b>Fault tolerance</b>	■		■		■		■		■		■ (H / FH CPU)		■	
<b>Configuration changes during operation (CIR)</b>	■		■		■		■		■		■		■	
<b>Connection / disconnection of centralized I/O during operation (hot swapping)</b>	■		■		■		■		■		■		■	
<b>HMI functions</b>	Integrated		■		■		■		■		■		■ (can be installed on PC)	
<b>PC functions</b>	C/C++/C#/Visual Basic link		■		■		■		■		■		■ (via ODK)	
<b>Data acquisition and archiving</b>	■		■		■		■		■		■		■ (via ODK)	
<b>Expandable with PC standard hardware</b>	■		■		■		■		■		■		■ (via ODK)	
<b>Integration of PC standard HW/SW</b>	■		■		■		■		■		■		■ (via ODK, OPC)	
<b>Engineering</b>	Configuration / programming software		STEP 7 Basic V12 in the TIA Portal, STEP 7 Professional V12 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 Professional from V12 in the TIA Portal		STEP 7 Professional from V12 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal		STEP 7 / STEP 7 Professional from V5.x, STEP 7 from V11 in the TIA Portal	
<b>Programming languages</b>	KOP, FUP, SCL		KOP (LD), FUP (FBD), AWL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC		KOP (LD), FUP (FBD), AWL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC		LAD (LD), FDB, STL (IL), S7-Graph (SFC) available soon, S7-SCL (ST)		LAD (LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)		LAD (LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)		LAD (LD), FDB (FBD), STL (IL), S7-Graph (SFC), S7-SCL (ST), S7-HiGraph, CFC 4)	
<b>Configuration of integral HMI functions</b>	■		■		■		■		■		■		WinCC flexible (optional)	
<b>Communications</b>	MPI		■		■		■		■		■		■	
<b>PTP</b>	■ (character-based serial comm.)		■		■		■ (also via CP)		■ (via CP)		■		■ (via CP distributed)	
<b>AS-Interface</b>	■ (via CP with STEP 7 V11 SP2)		■		■		■ (via CP)		■		■		■ (via CP distributed)	
<b>PROFIBUS</b>	■		■		■		■ (also via CP 4)		■		■		■ (via CP distributed)	
<b>PROFINET IO</b>	■		■ (PN CPU)		■		■ (also via CP)		■ (also via CP)		■		■ (via CP distributed)	
<b>Others integrated</b>	■		■		■		■		■		■		■	
<b>Web server</b>	■ (Smart Device Access, SIMATIC S7-1200 App)		■ (PN CPU)		■		■ (PN CPU)		■ (PN CPU)		■		■	

6 SIMATIC Controllers  
 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) 1.5 MB with F version  
 7) also TF-CPU with PROFINET

7 SIMATIC Controllers  
 1) via PC cards and ODK  
 2) non-paged memory  
 3) 128 KB with specific SIMATIC PC without UPS  
 4) with F variant: S7 Distributed Safety, LAD, FBD for F program  
 5) with WinAC RTX 2010

8 SIMATIC Controllers  
 1) via ODK  
 2) (large volumes of data)  
 3) (1 PCI-104 card max.)  
 4) (via ODK, OPC)





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Answers for industry.



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