Positioning within the SIMATIC family

Micro Automation
- Small, compact systems
- Easiest programming tools with Wizards
- Micro automation sets as solution from one supplier

 Totally Integrated Automation
- Shared data management, configuring and communications
- Highest performance
- Programming with high-level languages

Overview

SIMATIC S7-200

Approvals

Hardware CPU

Hardware EM

Communication EM's

HMI

MicroWin V4.0

Applications
S7-200 Second Generation Overview

CPU 221
(10 I/O Points)

CPU 222
(14 I/O Points)

CPU 224
(24 I/O Points)

CPU 224XP
(24 I/O Points)

CPU 226
(40 I/O Points)

Improved
2004

New
2004

Improved
2004

Overview
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Hardware CPU
Hardware EM
Communication EM’s
HMI
MicroWin V4.0
Applications
### Features: CPUs (1/2)

<table>
<thead>
<tr>
<th>Features</th>
<th>CPU 221</th>
<th>CPU 222</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Inputs/Outputs</td>
<td>6DI/4DO</td>
<td>8DI/6DO</td>
</tr>
<tr>
<td>Max. Expansion Modules</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Max. # of Dig. I/O Channels</td>
<td>10</td>
<td>78</td>
</tr>
<tr>
<td>Analogue Points In/Out/Max</td>
<td>-</td>
<td>8/4/10</td>
</tr>
<tr>
<td>Program/Data Memory</td>
<td>4KB/2KB</td>
<td>4KB/2KB</td>
</tr>
<tr>
<td>Boolean Execution Time</td>
<td>0.37 µs</td>
<td>0.37 µs</td>
</tr>
<tr>
<td>Bit Relays/Counters/Timers</td>
<td>256/256/256</td>
<td>256/256/256</td>
</tr>
<tr>
<td>High Speed Counters</td>
<td>4 x 30 kHz</td>
<td>4 x 30 kHz</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Pulse Outputs</td>
<td>2 x 20 kHz</td>
<td>2 x 20 kHz</td>
</tr>
<tr>
<td>Communication Interface</td>
<td>1x RS-485</td>
<td>1x RS-485</td>
</tr>
<tr>
<td>Analogue Potentiometers</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
### Features: CPUs (2/2)

<table>
<thead>
<tr>
<th>Features</th>
<th>CPU 224</th>
<th>CPU 224XP</th>
<th>CPU 226</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Inputs/Outputs</td>
<td>14 DI/10 DO</td>
<td>14 DI/10 DO</td>
<td>24 DI/16 DO</td>
</tr>
<tr>
<td>Integrated Analogue In/Out</td>
<td>-</td>
<td>2AI/1A0</td>
<td>-</td>
</tr>
<tr>
<td>Max. Expansion Modules</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Max. # of Dig. I/O Channels</td>
<td>168</td>
<td>168</td>
<td>248</td>
</tr>
<tr>
<td>Analogue Points In/Out/Max</td>
<td>28/14/35</td>
<td>30/15/38</td>
<td>28/14/35</td>
</tr>
<tr>
<td>Program/</td>
<td>8/12 KB</td>
<td>12/16 KB</td>
<td>16/24 KB</td>
</tr>
<tr>
<td>Data Memory</td>
<td>8 KB</td>
<td>10 KB</td>
<td>10 KB</td>
</tr>
<tr>
<td>Boolean Execution Time</td>
<td>0.22 µs</td>
<td>0.22 µs</td>
<td>0.22 µs</td>
</tr>
<tr>
<td>Bit Relays/Counters/Timers</td>
<td>256/256/256</td>
<td>256/256/256</td>
<td>256/256/256</td>
</tr>
<tr>
<td>High Speed Counters</td>
<td>6 x 30 kHz</td>
<td>4 x 30 kHz</td>
<td>6 x 30 kHz</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>Integrated</td>
<td>Integrated</td>
<td>Integrated</td>
</tr>
<tr>
<td>Pulse Outputs</td>
<td>2 x 20 kHz</td>
<td>2 x 100 kHz</td>
<td>2 x 20 kHz</td>
</tr>
<tr>
<td>Communication Interface</td>
<td>1 x RS-485</td>
<td>2 x RS-485</td>
<td>2 x RS-485</td>
</tr>
<tr>
<td>Analogue Potentiometers</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

New & Improved 2004
S7-200 Standards

- Standards Compliance:
  - European Community
  - Underwriters Laboratory
  - Factory Mutual Approved
  - C-Tick for Australia & New Zealand

- Maritime Approvals:
  - Lloyds Register of Shipping (LRS)
  - American Bureau of Shipping (ABS)
  - Det Norske Veritas (DNV)
  - German Lloyd (GL)
  - Nippon Kaiji Kyokai (NK)
  - Bureau Veritas (BV)
  - Polski Rejestr Statkow
Built-in Features

- CPU Status LEDs
- Communication Port(s)
- Removable Terminal Blocks (224(XP),226)
- Snap-On Clip for DIN Rail Mounting
- 24V Sensor Power Output
- Mounting Holes for Panel Installation

Internal:
- Power Supply
- Super Capacitor
- Clock (224(XP),226)

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224XP Built-in Features

- Removable Terminal Blocks (224,226)
- Snap-On Clip for DIN Rail Mounting
- New 2004

- Mounting Holes for Panel Installation
- Cartridge Slot
- Communication Ports

- CPU Status LEDs
- I/O Point Status LEDs

- Removable Analogue Terminals

- Internal:
  - Power Supply
  - Super Capacitor
  - Clock (for 224,224XP,226)

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SIMATIC S7-200 in detail ...

Clock and battery module

- Real-time clock and calendar
  (for 221, 222 CPU)

- Typically 200 days backup.

Battery module

- Backup of the internal data
  (data block)

- Typically 200 days backup

Flexible Memory Modules

- For general program transfer and backup

- Data Logging Files, Recipes Files, and General File Storage

Overview

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Communication EM's

HMI

MicroWin V4.0

Applications

New 2004
All the new and improved CPUs have a multi purpose Diagnostic LED.
- The Diagnostic LED is combined with the System Fault LED.
- The combined LED is either RED or YELLOW depending on the fault.
- The Diagnostic LED is controlled by both the operating system and the user’s program by means of the Diagnostic instruction.
- The Diagnostic LED can be turned on when a value is FORCED or an I/O Error occurs or the USER’s program commands it on.
Expansion I/O Modules: General

- Up to 2 Modules (EM) for 222 CPUs
  ....up to 7 EMs for 224/226 CPUs

- Removable Terminals on digital I/O Modules

- Module Connection via I/O Expansion Ribbon Cable

CPU-Basic Device + Expansion Module
## Expansion I/O Modules …many options

### Digital
- 8 In DC
- 8 In AC, 120/230 VAC
- 16 In DC
- 4 Out DC – 5A
- 4 Out Relay - 10 A
- 8 Out DC - 0.75 A
- 8 Out AC - 120/230 VAC, 0.5 A
- 8 Out Relay - 2 A
- 4 In / 4 Out DC-DC
- 4 In / 4 Out DC-Relay

### Analogue
- 8 In / 8 Out DC-DC
- 8 In / 8 Out DC-Relay
- 16 In / 16 Out DC-DC
- 16 In / 16 Out DC-Relay

### Temperature Measurements
- 4 In
- 4 In / 1 Out
- 2 Out
- 4 In T/C
- 2 In RTD

### Technology
- Modem
- PROFIBUS DP Slave
- Ethernet
- AS-i Master
- IT Communication

### Approvals

### Hardware CPU

### Hardware EM

### Communication EM’s

### HMI

### MicroWin V4.0

### Applications

### Positioning
Positioning module (EM 253)

- **Provides High-Speed control, …from 12 to 200,000 PPS.**
  - Configurable backlash compensation
  - Continuous operation

- **Supports:**
  - *Jerk* (S curve) or *Linear acceleration* and *deceleration*
  - Supports absolute, relative and manual methods of position control

- **Simple programming and commissioning with the **Wizard**
S7-200 Networking possibilities: **Overview**

- **Ethernet Network**
- **Phone Network**
- **PROFIBUS Network**
- **AS Interface Field Bus**
- **PPI/MPI Network**
- **ASCII Protocol** (FreePort)

**S7-22x**
- CP 243-2
- EM 277

**Hardware EM**
- CP 241
- CP 243-1
- CP 243-1 IT

**Hardware CPU**
- CP 243-2
- CP 243-1

**Approvals**
- Email
- HTML
- FTP

**Applications**
- Positioning
Modem module (EM 241)

Provides:
- International telephone line interface
- Modem programmed with STEP7 Micro/WIN
- Password protection
- Security callback
- Plug&Play

Supports:
- The Modbus RTU protocol
- Numeric and text paging
- SMS messaging (depending on provider)
- CPU-to-CPU or CPU-to-Modbus data transfers

Simple programming with the Micro/WIN **Wizard**
PROFIBUS DP Slave Module (EM 277)

- Connects the S7-200 as a slave to a PROFIBUS DP network.

- Provides:
  - 9.6 KBit/s to 12 Mbit/s Transfer Rate (with Auto Detection)
  - PPI-Advanced, MPI und PROFIBUS DP protocol
  - Four LED Status Indicators
  - Station Address Selectable by Rotary Switches (0..99)

- Supports:
  - Max. 99 Devices on the Bus (Addresses from 0 ... 99)
  - Up to 1200 m Segment Length (at max. 93.75 KBit/s)
AS Interface Master Module (CP 243-2)

- Provides:
  - 2 Pushbuttons on Module to Toggle Display & Operation Mode
  - LEDs to Display Slave Status, Errors and Bus Status

- Supports:
  - 62 AS-Interface Slaves can be Connected
  - Cycle Length 5 ms (31 slaves) or 10 ms (62 slaves)
  - Cable Length 100 m
  - Class M1e Master

- Two Operation Modes:
  - Standard Operation
    (accessing I/O Data Blocks of the Slaves)
  - Extended Operation
    (also Write Parameter Data or Poll Diagnostic Data)

- Simple Programming with the **Wizard**
Ethernet Module (CP 243-1)

- **Simple…**
  - Connections as an EM
  - Allows processing data
  - Simple Network administration
  - Easy Exchanging of Modules (plug & play)

- **Provides**
  - Ethernet access via an RJ45 jack
  - A connection to **PC-Access** software
  - Remote programming, configuration and diagnostics
  - Simultaneous communication with up to 8 S7 controllers

- **Facilitates a flexible and distributed automation structure**

- **Simple Programming with the **Wizard**
Ethernet Networking with CP 243-1

- Communication via Industrial Ethernet
- Uses Standard Read & Write Services
- Up to 212 bytes of user data per command.
- Supports up to 8 communication channels
- Client / Server operating
- Simple Programming with the **Wizard**

![Ethernet Cable](image)
IT Communications Module (CP 243-1 IT)

- Provides:
  - The same network features like the CP 243-1
  - Send up to 32 E-Mail’s
  - Transfers up to 32 files via FTP
  - Integrated Web Server
  - Built-in user diagnostic HTML pages
  - Built-in system diagnostic HTML pages

- Supports:
  - Visualization with JAVA and HTML
  - Data exchange of files by means of FTP

- Simple Programming with the Wizard
Human-Machine Interface Units

Matched to the S7-200

- Optimal Price / Performance ratio
- Easy Engineering with TD 200-Wizard, TP Designer and WINCC flexible micro

Text Display
TD 200C
With User-Customized Faceplate

Touch Panels:
- TP 070
- TP 170micro

Text panels

Graphics panels

PC-based human machine interface

SIMATIC S7-200
STEP7-Micro/WIN 32

.... Setting **THE** Standard in *Micro PLC Programming*

- Simple Installation and Configuration
- EASY to Learn, EASY to Use
- Comprehensive programming tool
- Find & Correct quickly fixes errors
- Tools to handle Running PLC Changes
- Documentation for easy maintenance
- Wizards simplify programming tasks
- Software tools for easy commissioning

**MicroWin V4.0**

Applications
Your Choice of Editors

Use the right tool for the job

- Ladder & FBD editors for graphic languages (IEC 1131-3)
- STL for text programming
- Switch between editors as necessary
- Easy error identification
- Save project in any case

LADDER

STL

FBD
The Wizards: Overview

Wizards make the programming easier

- **TD 200 Text Display**
- **Internet Module**
- **Ethernet Module**
- **High Speed Counters**
- **NETR/NETW Networking**
- **PID Control Instruction**
- **Modem Module**
- **External Modem**
- **PTO/PWM**
- **Position Module**
- **Map AS-i Slaves**
- **Change AS-i Addresses**
- **AS-i Wizard**
- **Position Control Panel**
- **Recipe Wizard**
- **Data Log Wizard**
- **Recipe**
- **Recipe**
- **Remote Modem**
- **EM 253 Control Panel**
- **EM 241 Modem**
- **Internet**
- **NETR/NETW**
- **PID**
- **PTO/PWM**
- **Control Panel**
- **TD 200 Text Display**
- **PID Auto Tune Control Panel**
Application examples

...over 1,000,000 applications world wide

- Woodworking
- Conveyor systems
- Filling plants
- Pump controls
- Vacuum suction systems/elevators

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SIMATIC S7-200

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Elevators with optimal stopping accuracy

**Cost savings**
- Easy to adjust to individual customer requests
- Remote monitoring for cost-effective service

**Quality enhancement**
- Digital monitoring of shaft using incremental encoders (exact position acquisition of the elevator)
- Saves on magnetic switches
Suction extraction systems for woodworking

Cost savings
- Reduction in wiring and startup costs using the AS-Interface
- Connection of shutoff valves in the suction system
- Efficient service using modem technology

Quality enhancement
- Calculation of the optimal suction power
- Reduction in power consumption
Woodworking machinery

Cost savings
- Flexible solution for easy expansion
- Easy implementation of customer requirements

Quality enhancement
- Precise positioning for better control
Low-cost ball presses

Cost savings

- Simple and fast changeover from relay technology to PLC electronics
- Low space requirements for smaller control cabinet

Quality enhancement

- Flexible solution for easy expansion
- Increased operational information using non-volatile data backup
Maintenance and Support

- Worldwide Support:
  - Global Service and Repair Network
  - Quick Spare Parts Delivery
  - 24/7 Support Hotline
  - Programming Support
  - Product and Application Information
  - Training Seminars

- Internet Software Support:
  - Extensive Product Information including Manuals
  - Software and Documentation Updates
  - Tips & Tricks Application Examples
  - Demo Software
  - Online Training (Step 200)
SIS Co., Ltd.

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- Fax: 84-8-821 7184
- Email: sis-co@hcm.vnn.vn; support@sis-vn.com
- Website: sis-vn.com