

# Facts, facts, facts: The CPUs

## Identical technical specifications of the CPUs 221, 222, 224, 224XP, 224XPsi and 226:

| Feature   | CPU 221, 222, 224, 224XP, 224XPsi, 226  |
|---|---|
| 32-bit floating-point math in accordance with IEEE standard | yes   |
| Fully configurable, integrated PID controller               | yes, up to 8 independent PID loops  |
| Bit processing speed  | 0.22 µs   |
| Time-controlled interrupts                                  | 2 (cycle time between 1 and 255 ms at 1 ms resolution)  |
| Hardware interrupts (edge detection at inputs)              | max. 4 inputs   |
| Flags, timers, counters                                     | 256 each  |
| High-speed counters   | 4–6 (depending on CPU), max. 30 kHz, or 200 kHz with CPU 224 XP   |
| Pulse outputs (pulse-width- or frequency-modulated)         | 2 outputs, 20 kHz each (for DC versions), 100 kHz with CPU 224 XP   |
| Program and data memory                                     | retentive (non-volatile)  |
| Storage of dynamic data after a power interruption          | retentive: non-volatile via internal high-performance capacitor and/or additional battery module: loading of data lock with STEP 7-Micro/WIN, TD 200C or by user program to integrated EEPROM |
| Backup of dynamic data with battery module                  | typ. 200 days   |
| Built-in serial port(s)                                     | yes, RS 485 interface supporting the following operating modes: PPI master or slave/MPI slave/Freeport (freely configurable ASCII protocol), Modbus Master/Slave                              |
| Max. baud rate  | 187.5 kbaud (PPI/MPI) or 115.2 kbaud (Freeport)   |
| Programming software  | STEP 7-Micro/WIN supports all standards such as STL, CSF or LAD   |
| Optional program memory module                              | yes, programmable in CPU, for program transmission, data logging, recipe, documentation   |
| DC/DC/DC version  | yes   |
| Supply voltage  | 24 V DC   |
| Digital inputs  | 24 V DC   |
| Digital outputs   | 24 V DC, max. 0.75 A, parallel connection possible for higher switching capacity  |
| AC/DC/relay version   | yes   |
| Supply voltage  | 85–264 V AC   |
| Digital inputs  | 24 V DC   |
| Digital outputs   | 5–30 V DC or 5–250 V AC, max. 2 A (relay)   |

## Accessories

| Cable                 | RS 232 Smart Cable (Multimaster <sup>1, 2, 3</sup> ) | USB Smart Cable (Multimaster <sup>4</sup> ) |
|-----------------------|--|---|
| Isolation             | yes  | yes   |
| Power supply          | from CPU   | from USB Port                               |
| Supported protocols   | PPI and ASCII (Freeport); 10/11 bit                  | PPI; 10/11 bit                              |
| PPI communication     | 9.6 k; 19.2 k; 187.5 k                               | 9.6 k; 19.2 k; 187.5 k                      |
| Communication setting | DIP switch; RS 232 automatically                     | unnecessary                                 |
| LED display           | yes  | yes   |
| Required software     | STEP 7-Micro/WIN V3.2 from SP4                       | STEP 7-Micro/WIN V3.2 from SP4              |






1) as SIPLUS component also for extended temperature range –25...+70 °C and aggressive atmospheres/condensation ([www.siemens.com/siplus](http://www.siemens.com/siplus))

2) RS 232 Smart Cable: for networks and external modems (including GSM and GPRS)

3) Settings, e.g. for modems, are stored permanently

4) USB Smart Cable: Multimaster for USB

Specific technical data on the CPUs:

| Feature  | CPU 221 <sup>1</sup>  | CPU 222 <sup>1</sup>  | CPU 224 <sup>1</sup>  | CPU 224XP <sup>1</sup><br>CPU 224XPsi <sup>2</sup>                                    | CPU 226 <sup>1</sup>  |
|--|---|---|---|---|---|
|  |  |    |   |    |  |
| Integrated dig. inputs/outputs   | 6 DI/4 DO   | 8 DI/6 DO   | 14 DI/10 DO   | 14 DI/10 DO   | 24 DI/16 DO   |
| Digital inputs/outputs/max. number of channels with expansion modules    | –   | 48/46/94  | 114/110/224   | 114/110/224   | 128/128/256   |
| Analog inputs/outputs/max. number of channels with expansion modules     | –   | 16/8/16   | 32/28/44  | 2 AI/1 AO integrated<br>32/28/44  | 32/28/44  |
| Program memory   | 4 KByte   | 4 KByte   | 8/12 KByte  | 12/16 KByte   | 16/24 KByte   |
| Data memory  | 2 KByte   | 2 KByte   | 8 KByte   | 10 KByte  | 10 KByte  |
| Storage of dyn. data via high-performance capacitor                      | typ. 50 h   | typ. 50 h   | typ. 100 h  | typ. 100 h  | typ. 100 h  |
| High-speed counters  | 4 x 30 kHz,<br>of which 2 x 20 kHz<br>A/B counter usable                          | 4 x 30 kHz,<br>of which 2 x 20 kHz<br>A/B counter usable                            | 6 x 30 kHz,<br>of which 4 x 20 kHz<br>A/B counter usable                            | 4 x 30 kHz, 2 x 200 kHz<br>of which 3 x 20 kHz +<br>1 x 100 kHz<br>A/B counter usable | 6 x 30 kHz,<br>of which 4 x 20 kHz<br>A/B counter usable                            |
| Communications interfaces RS 485   | 1   | 1   | 1   | 2   | 2   |
| Supported protocols:   |   |   |   | both interfaces   | both interfaces   |
| – PPI master/slave   | yes   | yes   | yes   | yes   | yes   |
| – MPI slave  | yes   | yes   | yes   | yes   | yes   |
| – Freeport (freely config. ASCII protocol)                               | yes   | yes   | yes   | yes   | yes   |
| Optional communications possibilities                                    | not expandable  | yes, PROFIBUS DP Slave<br>and/or AS-Interface<br>Master/Ethernet/<br>Internet/Modem | yes, PROFIBUS DP Slave<br>and/or AS-Interface<br>Master/Ethernet/<br>Internet/Modem | yes, PROFIBUS DP Slave<br>and/or AS-Interface<br>Master/Ethernet/<br>Internet/Modem   | yes, PROFIBUS DP Slave<br>and/or AS-Interface<br>Master/Ethernet/<br>Internet/Modem |
| Built-in 8-bit analog potentiometer<br>(for commissioning, value change) | 1   | 1   | 2   | 2   | 2   |
| Real-time clock  | optional  | optional  | yes   | yes   | yes   |
| Integrated 24-V-DC sensor supply volt.                                   | max. 180 mA   | max. 180 mA   | max. 280 mA   | max. 280 mA   | max. 400 mA   |
| Removable terminal strip   | –   | –   | yes   | yes   | yes   |
| Dimensions (W x H x D in mm)   | 90 x 80 x 62  | 90 x 80 x 62  | 120.5 x 80 x 62   | 140 x 80 x 62   | 196 x 80 x 62   |

1) As SIPLUS component also for extended temperature range –25...+70 °C and aggressive atmospheres/condensation ([www.siemens.de/siplus](http://www.siemens.de/siplus))

2) CPU 224XPsi (current-sinking digital outputs)

