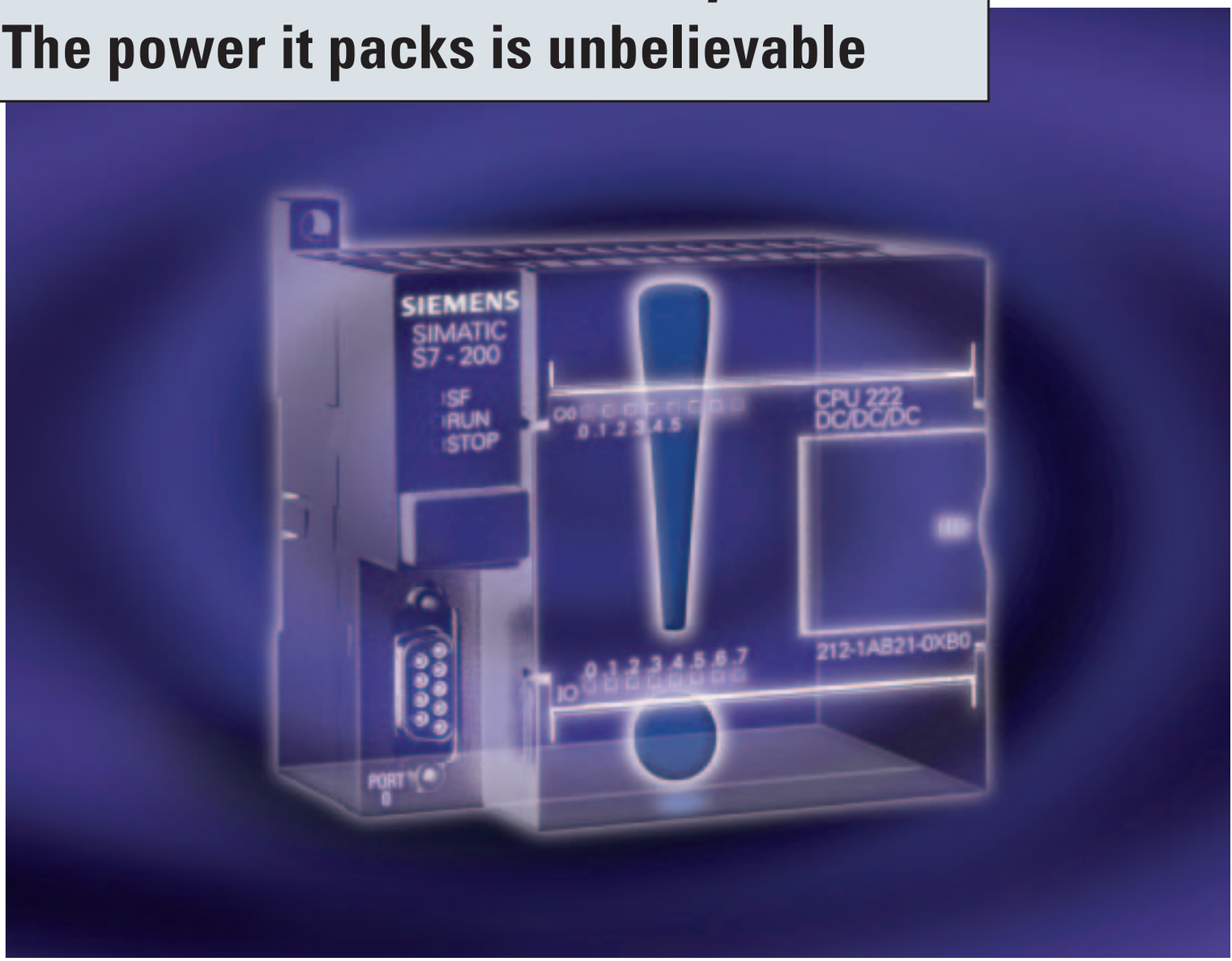
SIEMENS

The SIMATIC S7-200 micro system
The power it packs is unbelievable



Edition 11/00

The SIMATIC S7-200 micro system

Control Technology that gets the job done

The SIMATIC S7-200 micro system has really got what it takes: it is compact yet extremely powerful – particularly with respect to real-time response –, it is fast and highly communicative, and the software and hardware are extremely easy to use.

But that's not all: the SIMATIC S7-200 micro system has a completely modular design, permitting optimized solutions today, yet which allow expansion at any time in the future.

All this makes SIMATIC S7-200 a real cost-effective solution for your micro PLC needs – suitable for all automation applications needing maximum performance.

SIMATIC S7-200 has your profitability in mind. The complete range
- has a high performance,
- has an expandable modular design and
- provides open communication.

Furthermore, SIMATIC S7-200 makes hard jobs simple: the complete micro system is extremely easy to program. Applications can be implemented simply and rapidly – and the new toolbox software provides solutions even faster, simpler and more convenient.

Also new: microcomputing for PC-based operation and monitoring of the SIMATIC S7-200 while the process is running.

In the meantime, this micro system has been proven hundreds of thousands of times on a global scale, as stand-alone or network installations. It's now your turn to discover the power it packs!

Open communication

1. Integral standard RS 485 interface with data transmission rates between 0.3 and 187.5 kbit/s – depending on the protocol selected (PPI or FreePort)
2. Operation in FreePort mode with application-specific protocols
3. Fast connection to PROFIBUS using expansion modules as slave
4. Powerful master on AS-Interface using expansion modules
5. Accessible everywhere using facilities provided by modem communication

High Performance

1. Small and compact – ideal for all applications where space is limited
2. Uniform, comprehensive basic functionality in all CPU types
3. Large user memory
4. Exceptional real-time response – reliable control of your process at all times increasing your quality and efficiency
5. Communications capability using CPU Freeport instructions, PROFIBUS-DP Slave and AS-i Master expansion modules
6. Simple-to-handle programming as result of easy-to-use STEP 7-Micro/WIN software

Optimal modularity

1. The system engineering:

- 4 CPUs of various memory and built-in I/O sizes … all with comprehensive functionality and communication options
- Wide range of expansion modules for various functions:
  - Digital/analog expansions, can be scaled according to requirements
  - PROFIBUS-DP slave communication
  - AS-Interface master communication
  - Accurate temperature measurement
  - Built-in stepper motor pulse outputs
  - Remote diagnostics
- Operation and monitoring
- Convenient STEP 7-Micro/WIN software plus toolboxes

2. Easy system engineering – various automation requirements can be sized optimally

The SIMATIC S7-200 micro system

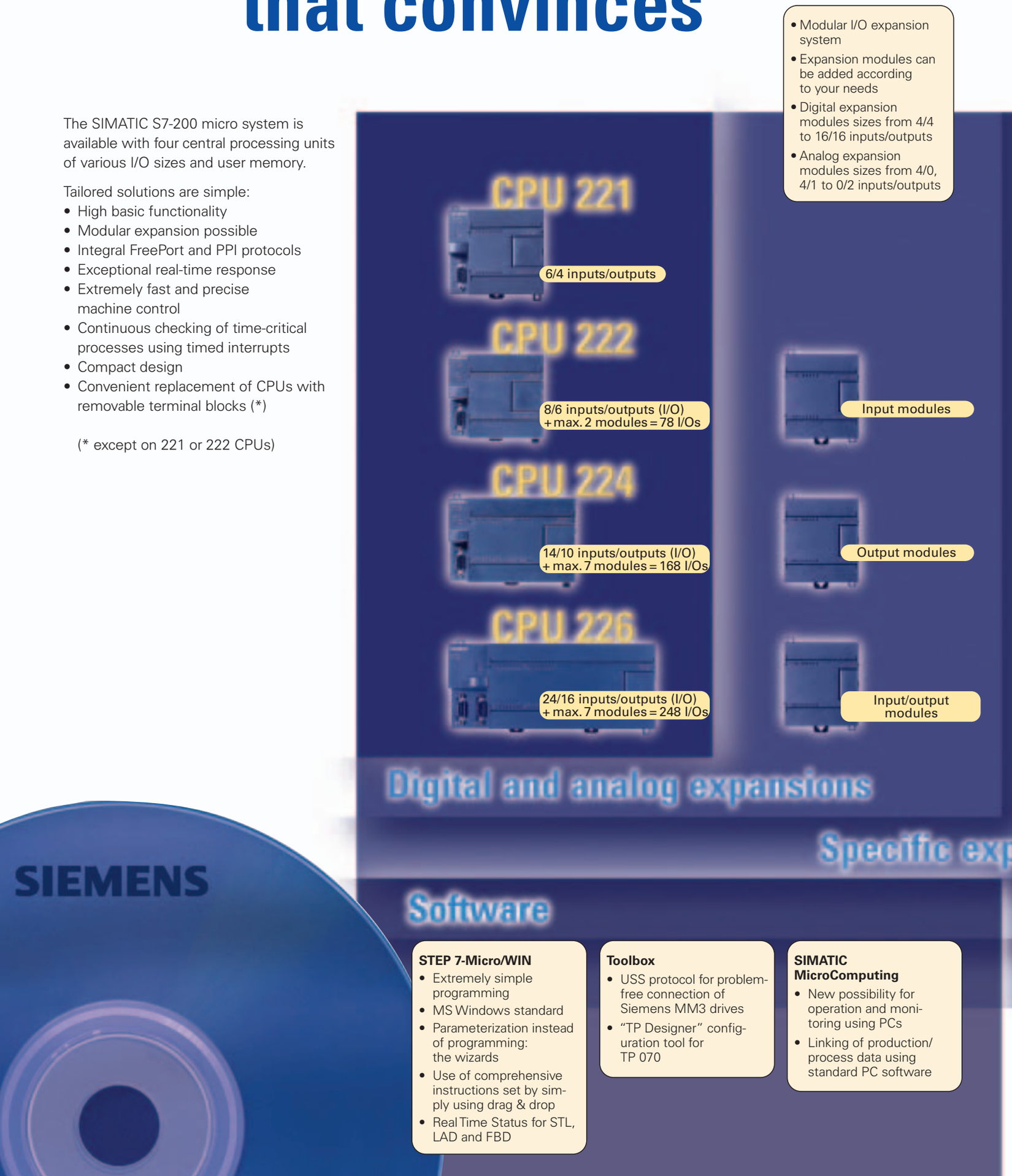
System Engineering that convinces

The SIMATIC S7-200 micro system is available with four central processing units of various I/O sizes and user memory.

Tailored solutions are simple:

- High basic functionality
- Modular expansion possible
- Integral FreePort and PPI protocols
- Exceptional real-time response
- Extremely fast and precise machine control
- Continuous checking of time-critical processes using timed interrupts
- Compact design
- Convenient replacement of CPUs with removable terminal blocks (*)

(* except on 221 or 222 CPUs)



- Modular I/O expansion system
- Expansion modules can be added according to your needs
- Digital expansion modules sizes from 4/4 to 16/16 inputs/outputs
- Analog expansion modules sizes from 4/0, 4/1 to 0/2 inputs/outputs

STEP 7-Micro/WIN

- Extremely simple programming
- MS Windows standard
- Parameterization instead of programming: the wizards
- Use of comprehensive instructions set by simply using drag & drop
- Real Time Status for STL, LAD and FBD

Toolbox

- USS protocol for problem-free connection of Siemens MM3 drives
- "TP Designer" configuration tool for TP 070

SIMATIC MicroComputing

- New possibility for operation and monitoring using PCs
- Linking of production/process data using standard PC software

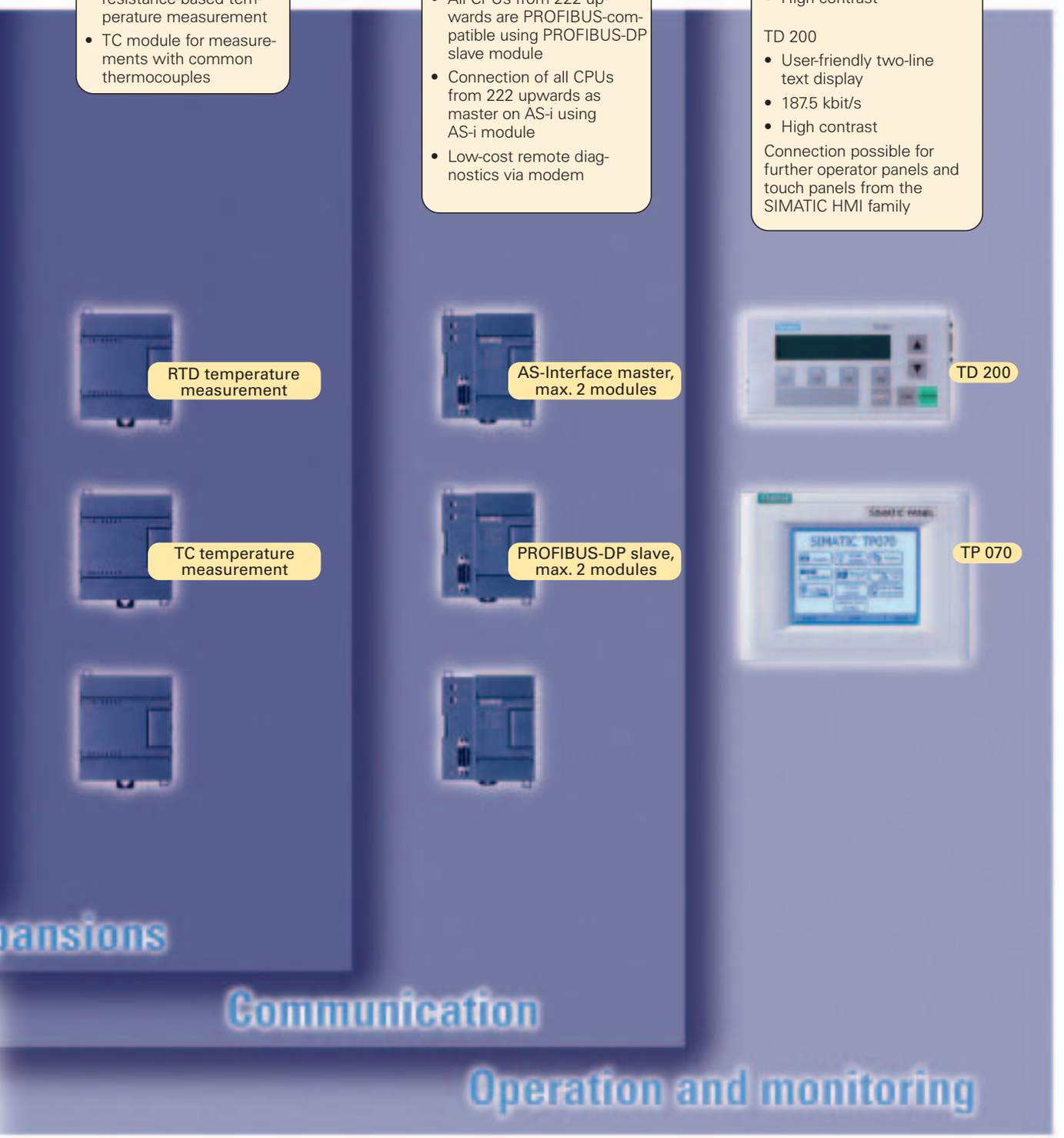
- Modules for accurate temperature measurement with resolution to 0.1 °C
- RTD module for resistance-based temperature measurement
- TC module for measurements with common thermocouples

- S7-200 system bus with FreePort interface – ASCII protocol – for external control of printers, barcode readers etc.
- All CPUs from 222 upwards are PROFIBUS-compatible using PROFIBUS-DP slave module
- Connection of all CPUs from 222 upwards as master on AS-i using AS-i module
- Low-cost remote diagnostics via modem

TP 070
- 5.7'' touch panel
- Numeric fields
- Bars and buttons
- High contrast

TD 200
- User-friendly two-line text display
- 187.5 kbit/s
- High contrast

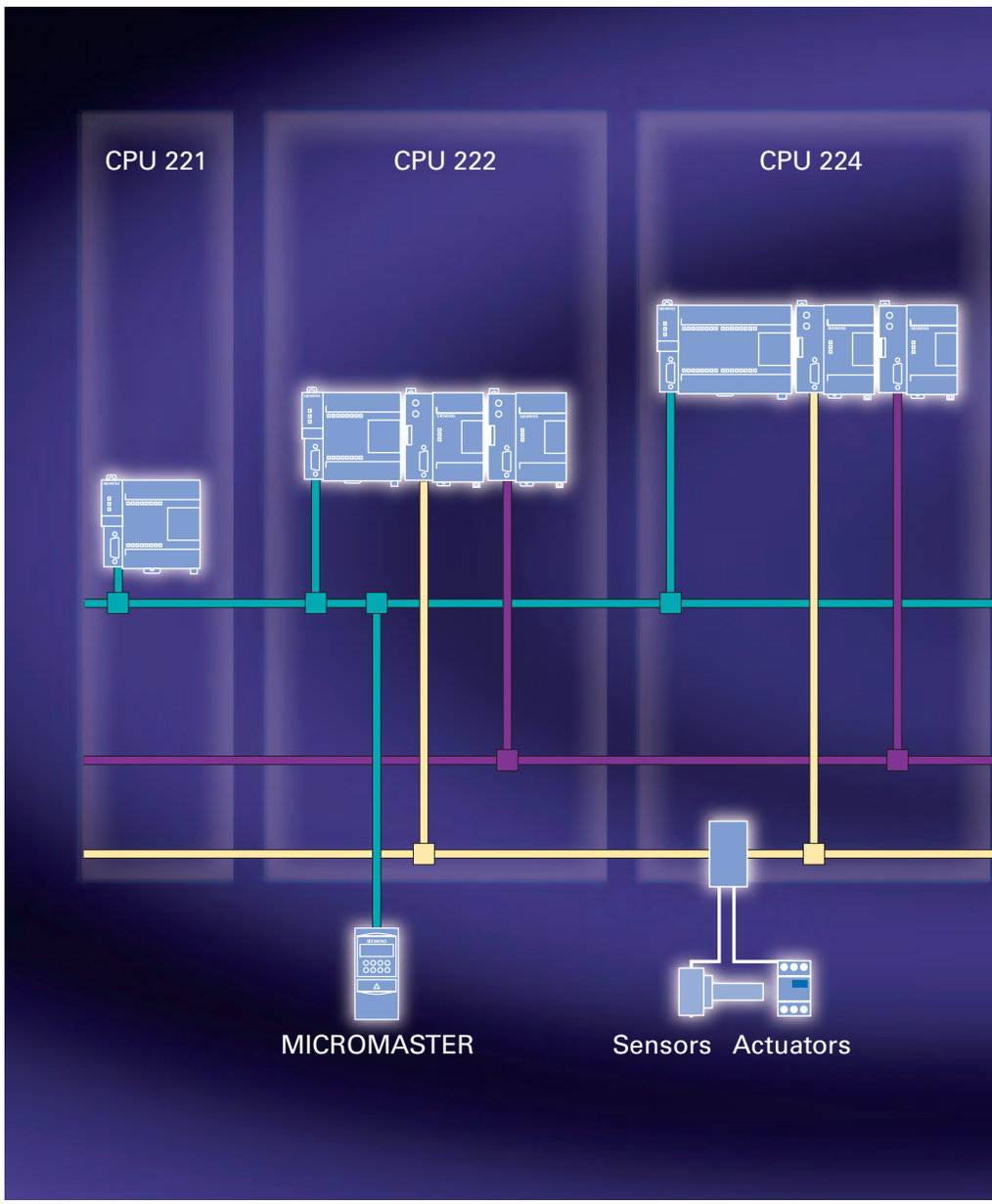
Connection possible for further operator panels and touch panels from the SIMATIC HMI family

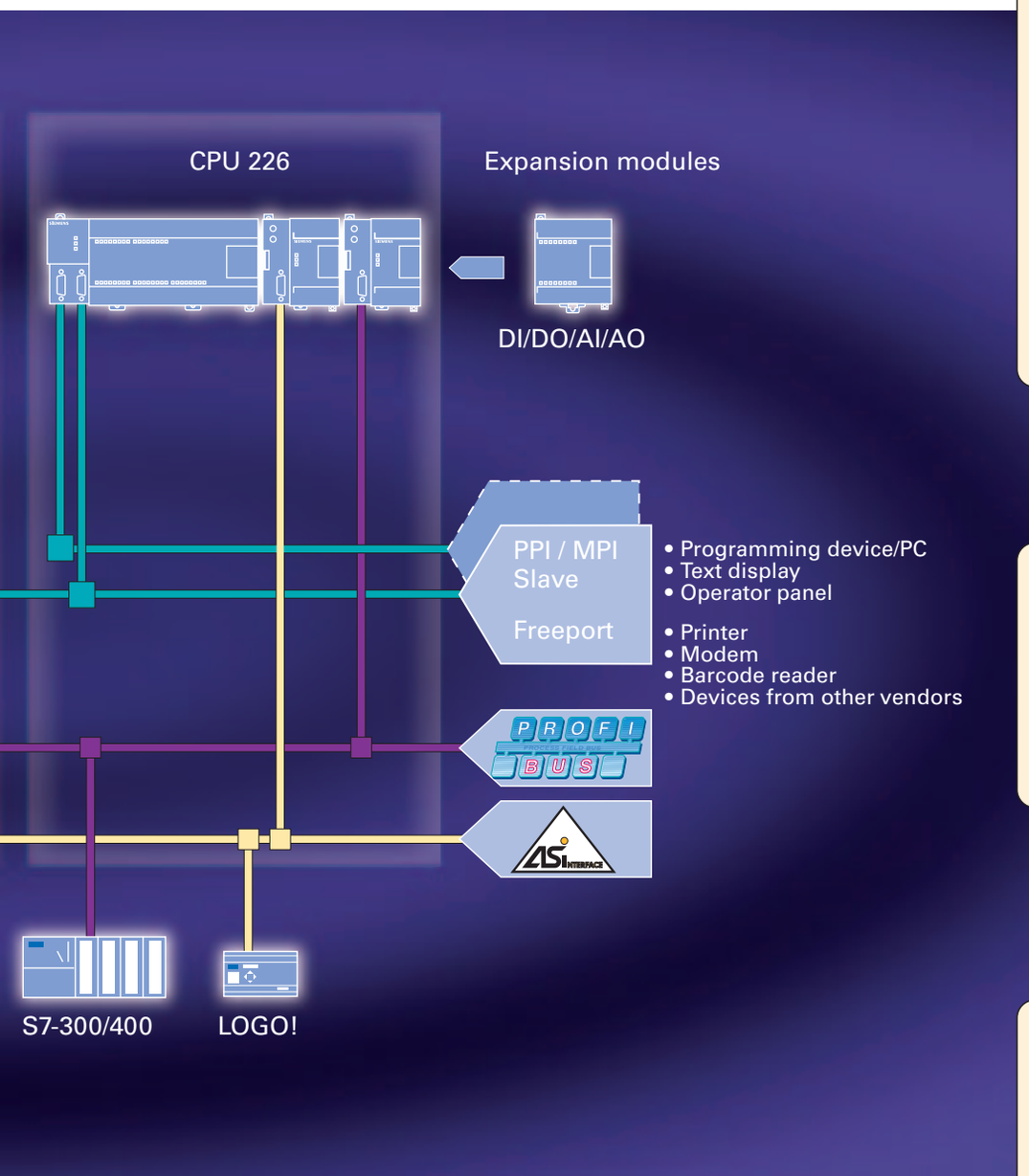


Micro PLC Engineering that offers more: Communication

The communications facilities provided by the SIMATIC S7-200 micro PLC are unique. The integral RS 485 standard interfaces can be operated at data transmission rates between 0.3 and 187.5 kbit/s:

- As a system bus with up to 126 stations. This permits trouble-free networking e.g. of programming devices, SIMATIC HMI products and SIMATIC CPUs. The integral PPI protocol is used for networks containing only S7-200. The S7-200 CPUs are linked as MPI slaves in a network containing TIA components (SIMATIC S7-300/400 and SIMATIC HMI etc.).
- In the FreePort mode, with application-specific protocols (e.g. ASCII protocol), the SIMATIC S7-200 is open for connection of many devices, e.g. modem, printer, barcode reader, PC, PLCs from other vendors etc. Using the USS protocol for Siemens drives, up to 31 MICROMASTER 3 drives can be controlled without additional hardware.





Modem communication

Modem communication means that the S7-200 CPUs can be accessed almost worldwide using standard commercial modems.

- Teleservice: modem communications means that expensive service visits can be avoided. Only two additional modems are required in order to use the complete programming functions such as program transfer, status or control; the communications tools are standard.
- Telecontrol: Remote interrogation of messages and measured values is possible via modem, just as the input of new set points or commands. A headend can control a number of substations. Communications using FreePort using the SMS function directly to a cell phone is possible or alarms to a fax unit.

Fast on the PROFIBUS

All CPUs from 222 upwards can also be operated as a slave on the PROFIBUS-DP network using the EM 277 communications expansion module. The EM 277 expansion module gives you the flexibility to add PROFIBUS-DP communications, as you need it – when you need it.

Powerful on the AS-Interface

The CP 243-2 turns the CPUs from 222 upwards into powerful masters on the AS-Interface. Up to 62 stations can be connected according to the new AS-i specification V 2.1. Analog sensors can also be linked without problem.

According to the new AS-i specification, up to 248 DI + 178 DO can be connected in the maximum configuration. 31 of the max. 62 stations can be analog modules.

Micro PLC Engineering that offers more: Software

Extremely simple user-programming …

The STEP 7-Micro/WIN programming software offers powerful programming and debugging tools, which make you more effective – and this means cost savings. You use the programming software in the same manner as with standard Windows applications. If you know Windows software, you'll have no problems with STEP 7-Micro/Win. User programs are written using mouse clicks, tool bars or simply drag & drop operations.

A comprehensive SIMATIC instruction set is standard, or if you desire IEC 1131 programming is available. Context-based on-line help provides handy support as needed. STEP 7-Micro/WIN can display and program several projects on the screen simultaneously – and copy complete sections of a program into another program simply by clicking with the mouse.

Structured programming means that you can design the program clearly with memory-optimized solutions. This program structure also guarantees that program components such as

- PID controllers,
- Mathematical calculations,
- Table operations and
- Communications routines

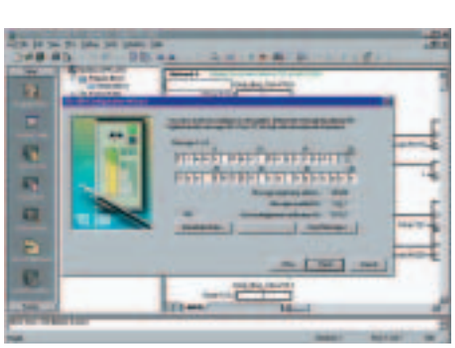
need only be programmed once and then used repeatedly.

Wizards included in Micro/WIN permit simple parameterization instead of programming. It is only necessary to fill in the parameters in the menus, and the software generates the program, e.g. for

- S7-200 system communications in the network,
- TD 200 configuring,
- PID controller configuring,
- High Speed counter configuring.

… even for commissioning, servicing and troubleshooting

The integral on-line functions, multiple programming options, program status, real-time edits, local and remote monitor and debug establish STEP 7-Micro/WIN software as the leader in Micro PLC programming.



SIMATIC MicroComputing

- Controls data transfer between CPU and PC using Microsoft standard mechanisms such as OLE, OPC …
- Data transfer between CPU and applications such as Visual Basic, Visual C++, Excel, Designer, Delphi, and Photoshop etc.
- Stock of control elements, displays and mechanisms permit simple generation of a graphical user interface on the PC.

The toolbox

The optional toolbox offers a library for simple configuring of the USS protocol as well as a graphic configuration tool for the TP 070 touch panel.

The **USS protocol library** contains all program blocks required for complete control of up to 31 drives on one bus system.

The graphic configuration tool **"TP Designer"** for the TP 070 enables extremely simple configuring of complex visualization tasks.

The SIMATIC S7-200 micro system

Micro PLC Engineering that offers more: Extras

TOP in real time

High-tech in every detail ensures the outstanding real-time characteristics of our new CPUs:

- 4 or 6 independent hardware counters @ 30 kHz each for interfacing to incremental encoders or high-speed pulse trains
- 4 independent interrupt inputs, with 0.2 ms input filter times to adjust reaction times – for maximum process response
- 2 high-speed pulse outputs @ 20 kHz each either pulse-width modulation or pulse train output, e.g. for control of stepper motors, drives or temperature
- 2 timed interrupts (adjustable from 1 ms in intervals of 1 ms) – for precise control of processes that change over time
- High-speed analog inputs – signal conversion with 25 µs, 12-bit resolution
- Real-time clock

Small and practical

EEPROM cartridge
A small, optional EEPROM cartridge saves you significant time and money. You can use it to easily copy, update or replace your application program on your S7-200 CPU. And if required, you can mail a program rapidly and at a low cost to your customers using this cartridge. Simply turn off the power, insert the cartridge, and reconnect the power … and – the user program is updated in a flash.

Battery cartridge
To guarantee that application data are never lost, the optional battery module permits long-term backup for typically 200 days beyond the internal backup of 5 days.

Real-time clock (either built in or on a cartridge)
Whether you require it to count operating hours, preheat rooms or provide time stamps for messages: the real-time clock of the S7-200 is software-controlled to provide exact seconds and dates – even taking leap years into account.

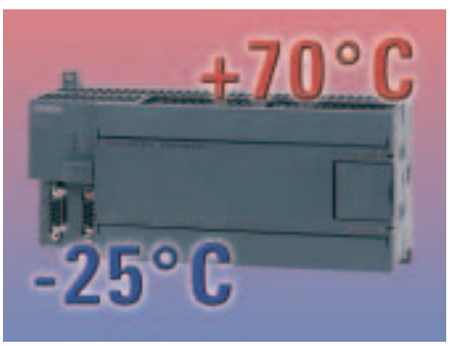
Analog potentiometers
With the S7-200's analog potentiometers, you can optimize your process by means of a screwdriver. You can set memory values, timer values, counter presets or other variables without having to intervene in the program. Very practical, for example, for modifying a welding time or an overshoot time rapidly and easily.

Complementary technology

SITOP power – perfectly matching the S7-200

SITOP power 24 V/3.5 A is the optimum power supply if connected loads can no longer be supplied as standard by the SIMATIC S7-200 CPU: the primary switched-mode regulator is fully matched to the micro PLC in design and functionality, and can be integrated into the PLC network like an S7-200 module.

For extreme cases: SIPLUS additions



Use under extreme conditions – no problem! SIPLUS additions are the solution for use in extended temperature ranges, for protection against condensation, or for other voltage ranges. Its CPUs are matched to the special demands.

SIMATIC S7-200 – the technology in detail
Comprehensive technical information is usually inserted at this position in the pocket at the bottom: many pages of pure technology (Order No. E20001-A0280-P272-X-7600).

Should the enclosure be missing, you can order one or more copies from us at any time. Simply copy the rear page of this document, fill in, and fax to us.

We shall then immediately send you the required number.

You can find further information in the enclosed brochures and on the Internet under www.ad.siemens.de/simatic/S7-200

The SIMATIC S7-200 micro system

SIMATIC S7-200

is everywhere – very near to you: at all Siemens branches, in selected electrical distributors or equipment wholesalers, and via catalog/mail order.

Name

Company

Dept.

Street/No.

P.O. Box

Post Code/City

More information on SIMATIC S7-200
Internet: www.ad.siemens.de/simatic/s7-200

- Instruction list (quick reference card)
- Tips & tricks
- Demo software
- Free software updates
- Download manuals

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or for supplementary technology::

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☐ "The new SITOP power generation" – the stabilized power supply for SIMATIC S7-200
☐ "SIPLUS additions" – use of devices under extreme conditions

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