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SIMATIC S7-1200 Basic Controller

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S7-1200

0 1 2 3 4 5
DI

CPU 1215C
DC/DC/DC

DIAG

0 1 2 3
AI

SIMATIC Controllers

The intelligent choice for your automation task!

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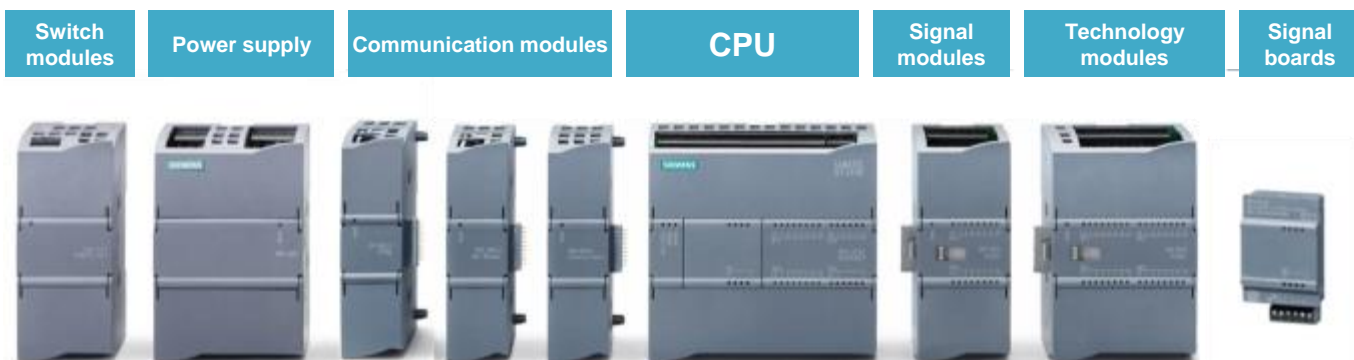
Advanced Controller (S7-1500)



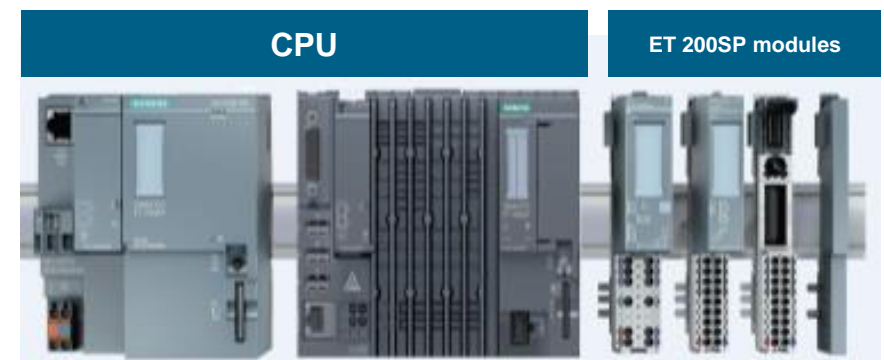
Software Controller S7-1500



Basic Controller (S7-1200)



Distributed Controller (ET 200SP CPU)



Key Innovation features

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+ Security Integrated

Protection against unauthorized access, copying & execution, and program manipulation

- ✓ Protects assets against unauthorized changes
- ✓ Protects intellectual property and investment

+ Integrated Diagnostics

Built-in, plain text messages – **NO PROGRAMMING REQUIRED**, displays even if CPU is in STOP

- ✓ Simplifies troubleshooting
- ✓ Minimizes downtime

+ Efficient Engineering

Single engineering framework for PLC, HMI, Drives, SCADA, network, etc.

- ✓ Efficient engineering & maintenance tasks saves time and costs

+ Innovative Design

Compact design with easy expansion options

- ✓ Flexible configuration options for easy adaptation
- ✓ Comprehensive networking possibilities reduce need for protocol converters and gateways

+ Technology Integrated

Standard Motion control, PID, Condition Monitoring and more all in one controller

- ✓ Integration saves time, money and panel space

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+ Safety Integrated

Safety and motion integrated in single controller up to SIL3, PLe CAT4

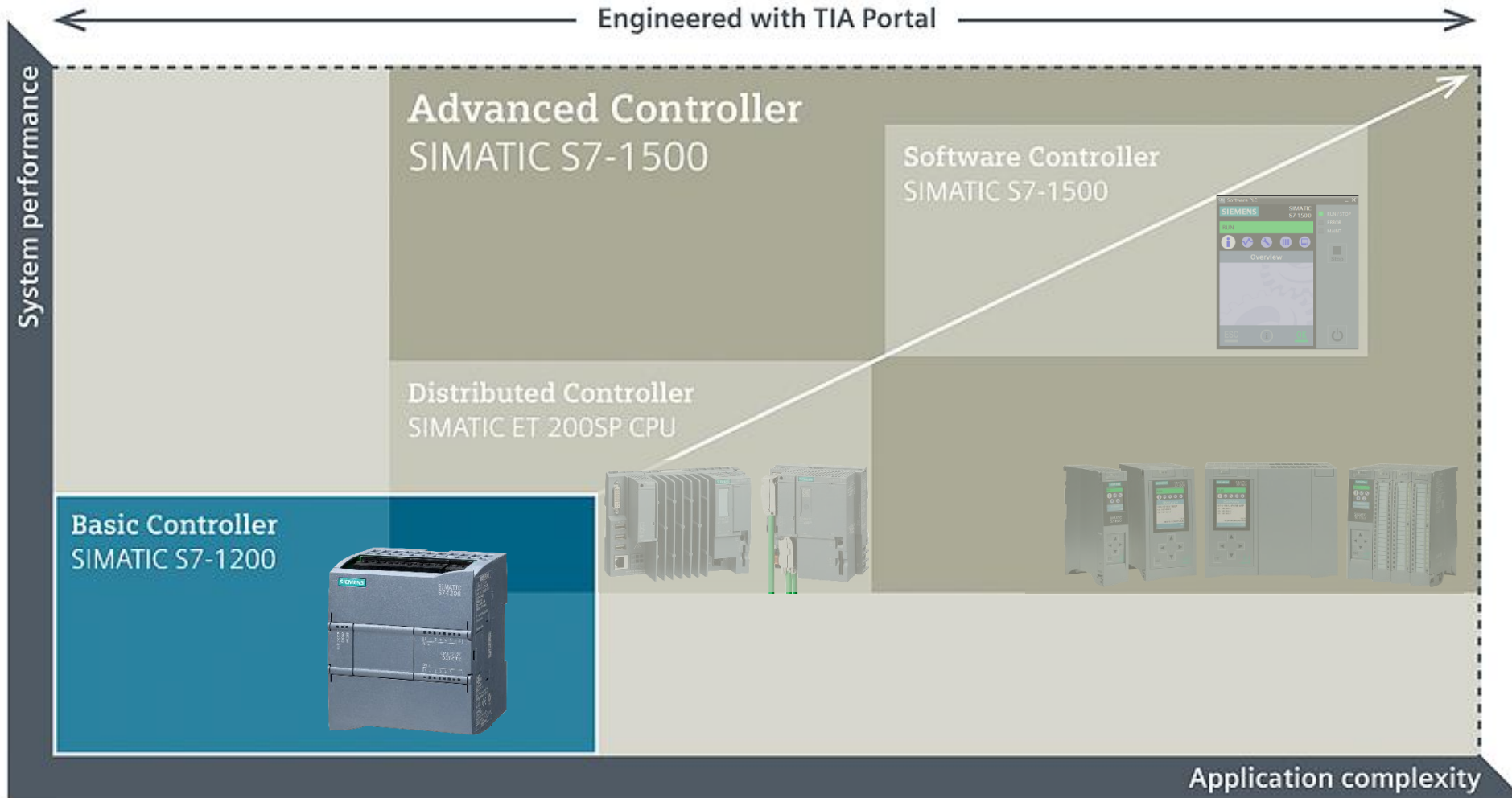
- ✓ Protects equipment and personnel from damage or injury
- ✓ Single network infrastructure for standard & safety data
- ✓ Single engineering framework for standard and safety tasks









SIMATIC Controllers

Scalable portfolio with comprehensive and consistent functionalities

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-  **Efficient engineering**
-  **Innovative design**
-  **Reliable diagnostics**
-  **Safety Integrated**
-  **Security Integrated**
-  **Technology Integrated**



Market Segments Applications

OEM

- Conveyor
- Elevators
- Material handling machinery
- Metal working
- Packing
- Printing
- Textile
- Mixer
- AGV

Remote Communications

- Waste water plant
- Oil/Gas pumping stations
- Petro-gas pumping stations
- Electric power distribution

Motion Control

- Automatic parts replacement
- Stacking machinery
- Conveyor
- Dispenser
- Material handling
- Packing
- Printing
- Textile
- Welding
- Solar Tracking

Infrastructure

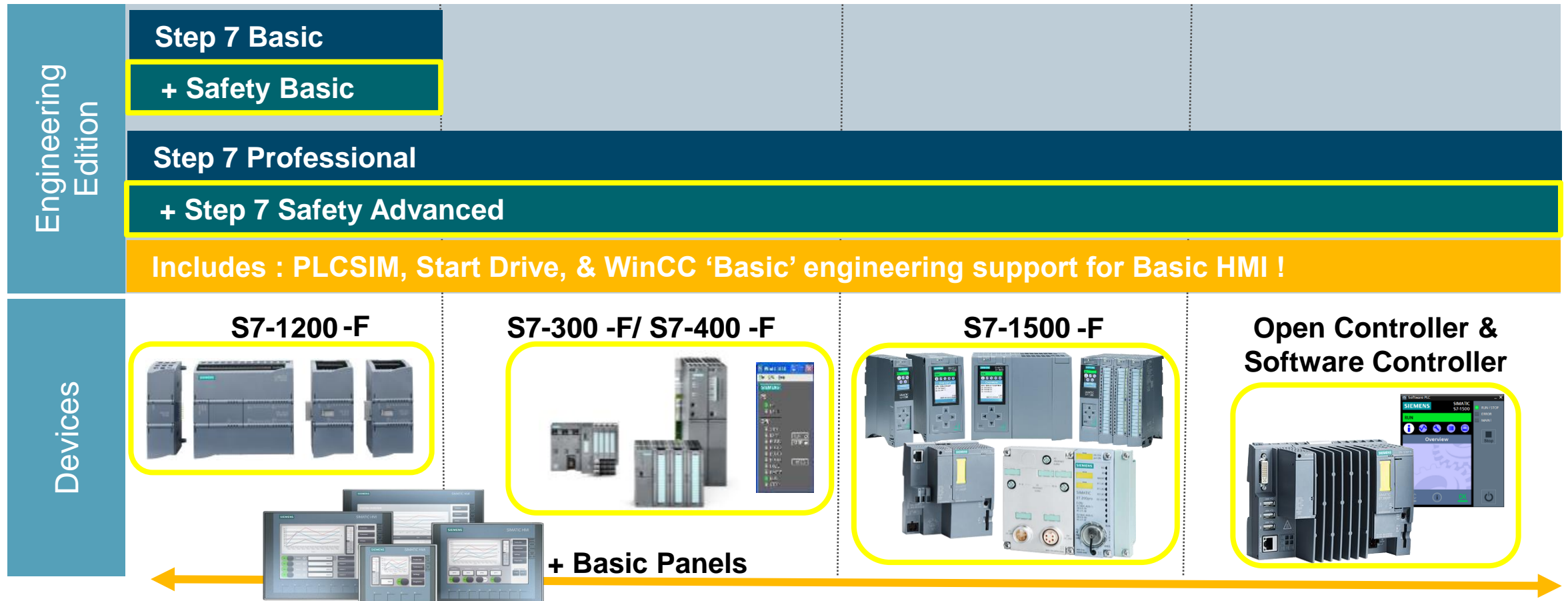
- Boiler control
- Chiller control
- Energy Management
- Fire protection
- HVAC
- Lighting Control
- Pump control
- Security access
- Transportation
- Irrigation
- Garage door
- Car Wash
- Bowling alleys
- Traffic control



SIMATIC Step 7 Basic/Professional

+ Safety Option for support of Fail-Safe Controllers

What variants of the Step 7 Software are available for licensing and purchase ?



Design and handling S7-1200 CPU – basic setup

Power supply
24VDC or
120/230 VAC

Slot for optional
memory card

Status LEDs for
CPU status and
integrated I/O

removeable
terminal blocks
for user wiring
(behind the
cover flaps)

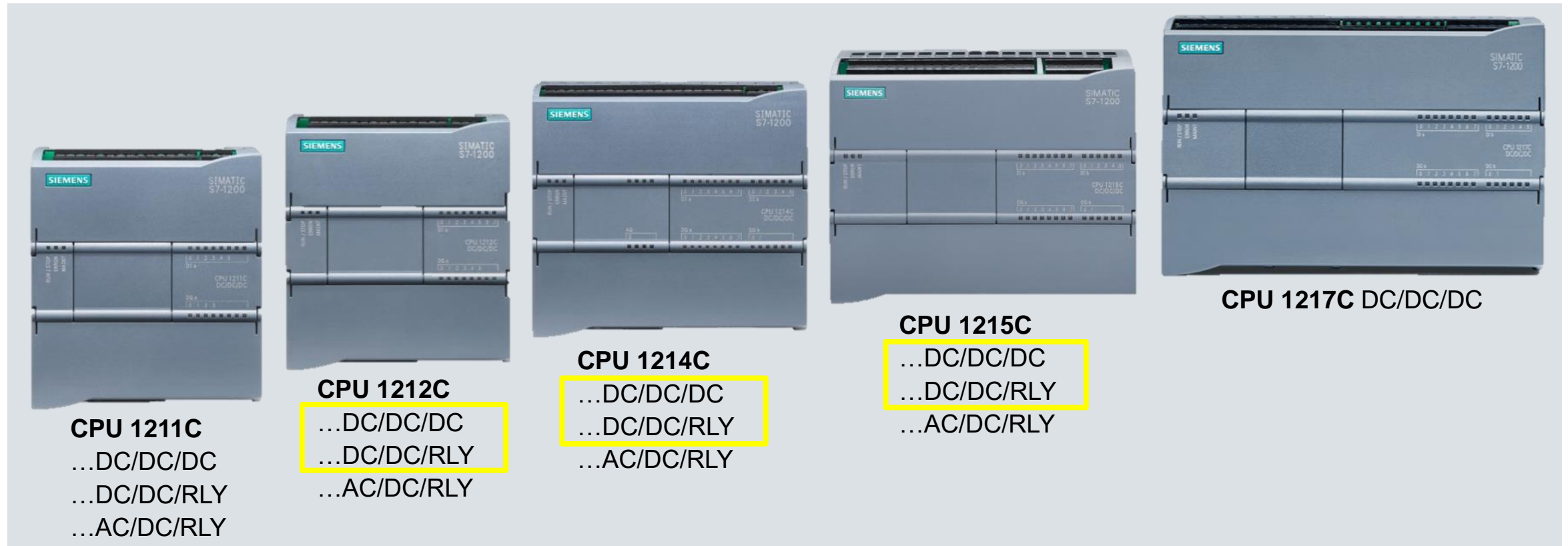
PROFINET
connection
(on the bottom
of the CPU)

Expansion slot
for option board
(SB, CB, or BB)



Design and handling CPU – 19 Versions incl. **failsafe**

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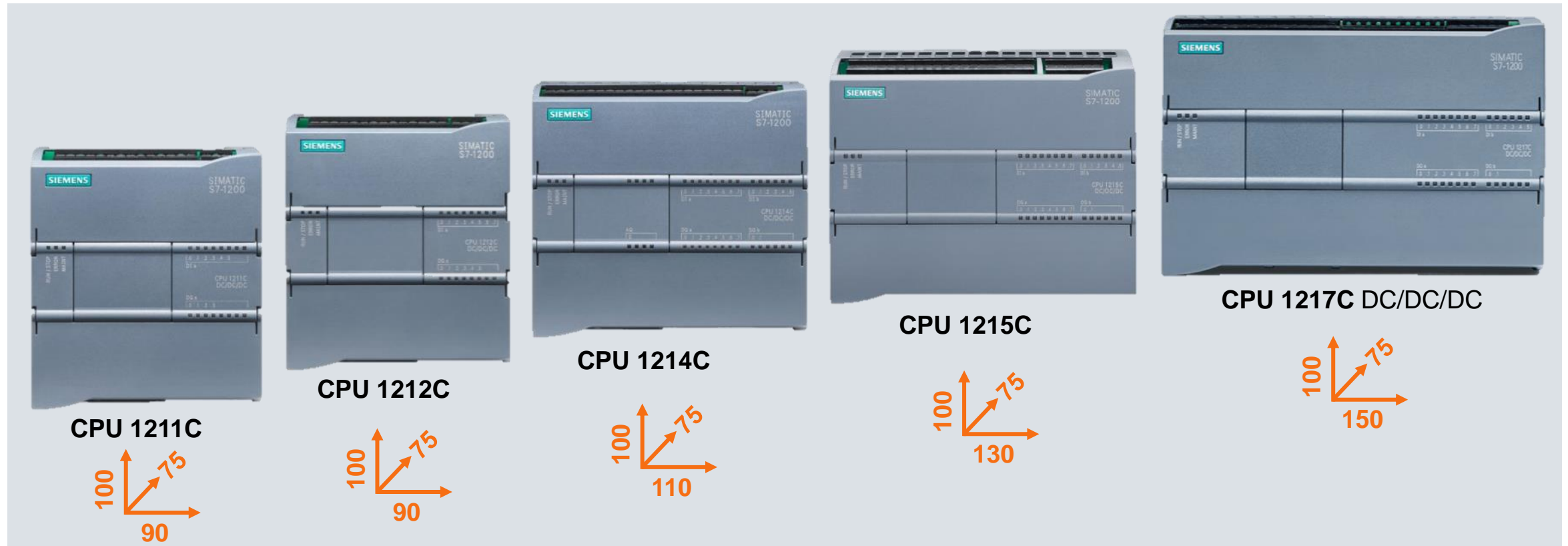


S7-1200:
variable extension and set-up options for differing requirements



Design and handling CPU dimensions

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S7-1200:
variable extension and set-up options for differing requirements



SIMATIC S7-1200

Product overview – Performance specifications

	Standard					Failsafe		
CPU	CPU 1211C	CPU 1212C	CPU 1214C	CPU 1215C	CPU 1217C	CPU 1212FC	CPU 1214FC	CPU 1215FC
Integrated PROFINET Ports	1	1	1	1 1	1 1	1	1	1 1
Work Memory / Int. Load Memory	50 KB / 1 MB	75KB / 2 MB	100 KB / 4 MB	125 KB / 4 MB	150 KB / 4 MB	100 KB / 2 MB	125 KB / 4 MB	150 KB / 4 MB
Integrated Digital I/O	6DI 4DO	8DI 6DO	14DI 10DO	14DI 10DO	10DI 6DO 4DI ¹⁾ 4DO ¹⁾	8DI 6DO	14DI 10DO	14DI 10DO
Analog Signals	2AI	2AI	2AI	2AI 2AQ	2AI 2AQ	2AI	2AI	2AI 2AQ
Integrated HSC	6 @100kHz	6 @100kHz	6 @100kHz	6 @100kHz	3 @100kHz 3 @1MHz	6 @100kHz	6 @100kHz	6 @100kHz
Pulse Outputs ²⁾	4	4	4	4	4	4	4	4
Expandable	3 – CM 1 - SB	3 – CM 1 – SB 2 – SM.	3 – CM 1 – SB 8 – SM	3 – CM 1 – SB 8 – SM	3 – CM 1 – SB 8 – SM	3 – CM 1 – SB 2 – SM	3 – CM 1 – SB 8 – SM	3 – CM 1 – SB 8 – SM

1) RS422/485

2) CPU versions with relay outputs require a digital signal board (SB) with use of pulse outputs



SIMATIC S7-1200

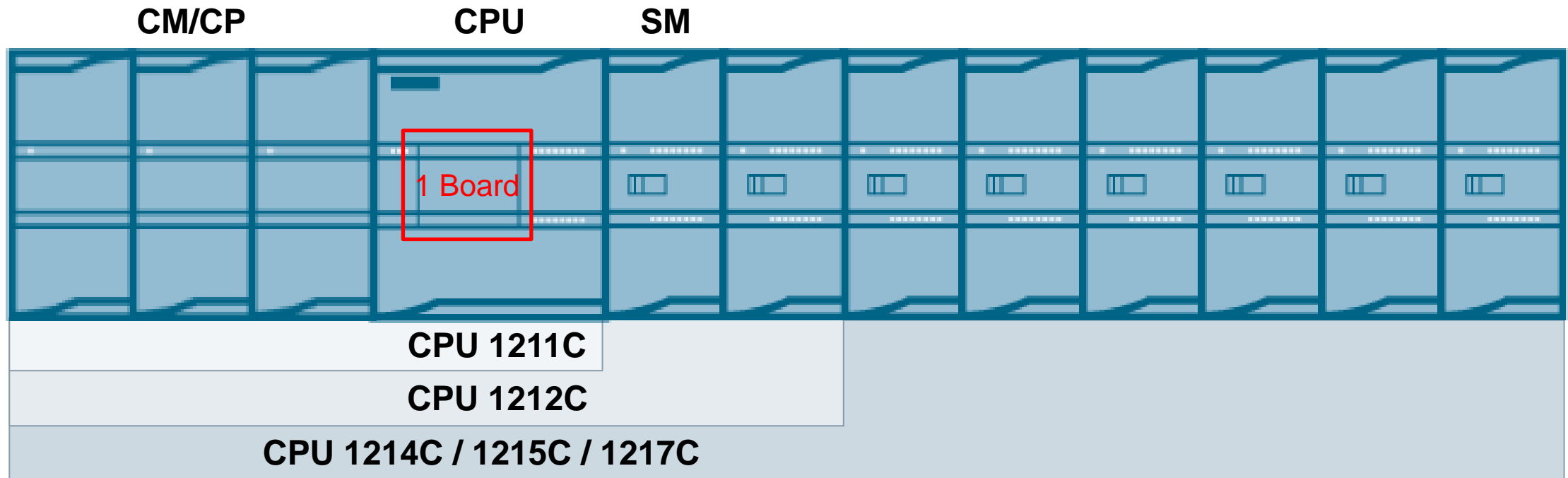
Product overview – Performance specifications (continued)



	CPU 1211C	CPU 1212C	CPU 1214C	CPU 1215C	CPU 1217C
Execution time Binary instruction	0.08 µs/operation				
Execution time Word instruction	1.7 µs/operation				
Execution time Real number instruction	2.3 µs/operation				
PROFINET Ports	1		2		
Type	RJ45				
Data rate (Ethernet)	10/100 MBaud				
Additional communication modules	3 max.				
Ambient conditions - Operation	-20°C to 60 °C horizontal assembly / -20°C to 50°C vertical assembly (observe derating conditions for individual modules)				
Real-time clock buffering	20 days, typ./min. 12 days at 40°C (maintenance-free high-performance capacitor)				
Dimensions W x H x D (mm)	90 x 100 x 75		110 x 100 x 75	130 x 100 x 75	150 x 100 x 75



Design and handling Local Expansion



S7-1200:
variable extension and set-up options for differing requirements



Signal Modules

Signal Boards

- Inputs
 - ✓ 24V or 5V DC
 - ✓ AI / RTD / TC
- Outputs
 - ✓ 24V or 5V DC
 - ✓ AO
- Hybrid DI/DO
2DI/DQ



Technology Modules

- Weighing modules
 - ✓ DMS load cells
 - ✓ Analog strain-gauge load
 - ✓ Dosing application
- Condition Monitoring System
 - ✓ Predictive Maintenance with IEPE vibration acceleration sensors
- Energy Meter
 - ✓ Measure and record of electrical parameters

Power Supply

- 24VDC or 120/240VAC Input

Digital Inputs

- ✓ 8/16 ch. incl. failsafe
- **Digital Outputs**
 - ✓ 8/16 ch. 24V,RLY incl. failsafe
- **Hybrid DI/DO**
 - ✓ 8/16 ch. 24V/RLY

Analog Inputs

- ✓ 4,8 channels 13 or 16 bits
- ✓ RTD
- ✓ TC
- **Analog Outputs**
 - ✓ AQ 2/4 ch.
- **Hybrid AI/AO**
 - ✓ AI 4/2 ch.



Communication Modules

- Teleservice
 - ✓ GSM/GPRS
 - ✓ ISDN
 - ✓ Modem adapter IE
 - ✓ RS232 adapter IE



- Communication Board RS485 Interface for serial communications
 - ✓ USS
 - ✓ PtP
 - ✓ Modbus RTU

- Serial Communication
 - ✓ RS232
 - ✓ RS485
 - ✓ RS422/485

- AS Interface v3.0
- IO-Link Master
- Rfid Identification

- Profibus DP
 - ✓ Master
 - ✓ Slave data exchange broadcast

SIMATIC S7-1200 CPUs have an integrated PROFINET port which supports:

- Industrial Ethernet
- PROFINET
- Modbus TCP-IP
- Software communications
 - ✓ OPC-UA Server
 - ✓ Direct connection to Cloud / Mindsphere



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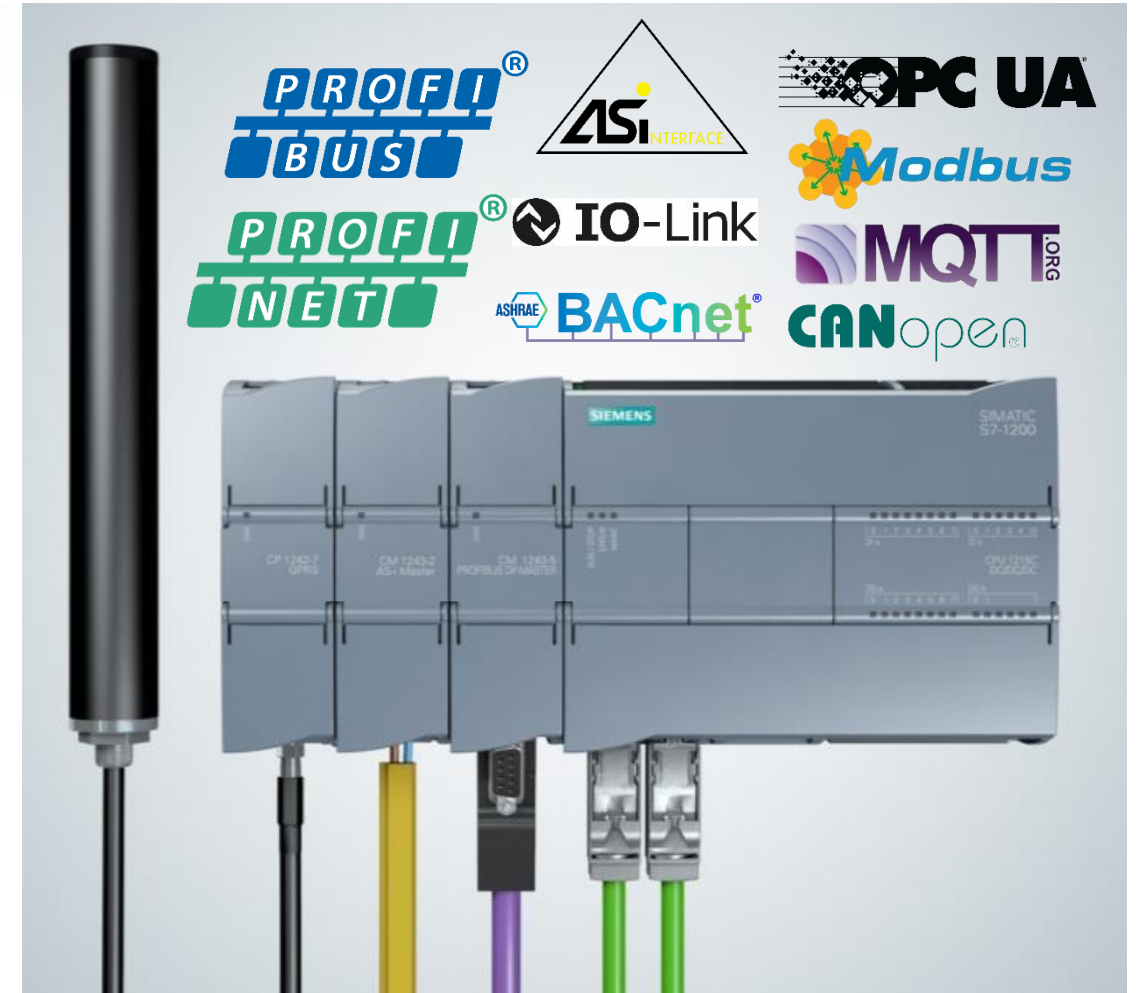
Comprehensive network options for SIMATIC S7-1200



Comprehensive network options

- PROFINET
- PROFIBUS Master / Slave
- OPC UA Server
- AS-i Master
- BACnet Client/Server*
- CANopen Master*
- TCP/IP Protocols (Modbus TCP, MQTT, HTTP, etc.)
- IO-Link Master
- GSM/GPRS/LTE
- DNP3, IEC 60870-5-104
- RFID
- PtP (RS-485, RS-422 & RS-232)
- Modbus RTU
- USS Protocol (Universal Serial Interface Protocol)

*with use of gateway

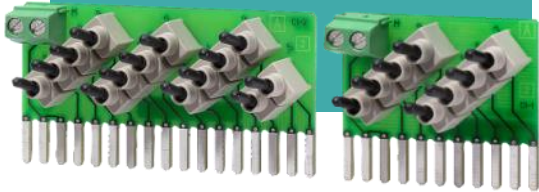


S7-1200 Accessories

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Simulator Boards

- For simulating Digital/Analog Inputs



Expansion Cable, 2m

- For extending layout of signal modules



SIMATIC Memory Card

- 4 MB
- 12 MB
- 24 MB
- 256 MB
- 2 GB
- 32 GB



Compact Switch Module

- Industrial Ethernet
- unmanaged switch
- (x4) RJ45 ports
- 24V DC power supply

Power Module

SIMATIC S7-1200 power module

- input 120/230 V AC
- output 24 V DC 2.5 A

Battery Board

Long term backup of the real time clock



Security Integrated: Defense-in-depth concept

System Integrity

- Know-How Protection
- Copy & execution Protection
- Access Protection
- Manipulation Protection
- Certificate authentication
- Secure communications



SIMATIC Integrated Technology

S7-1200 – integrated compact controllers

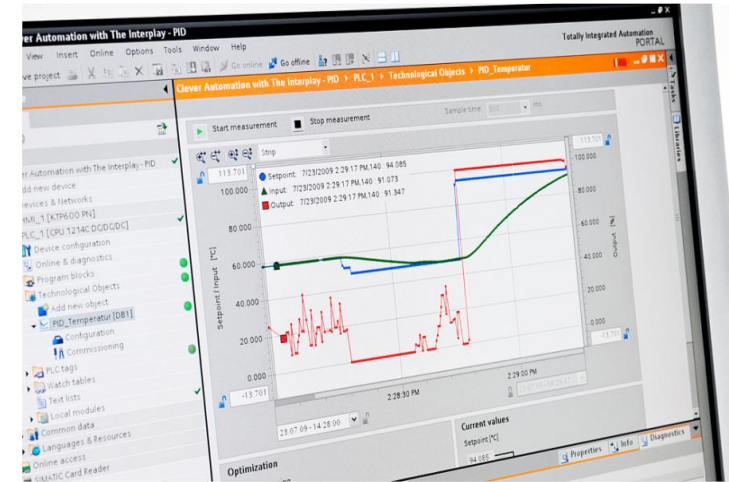
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Integrated PID controllers

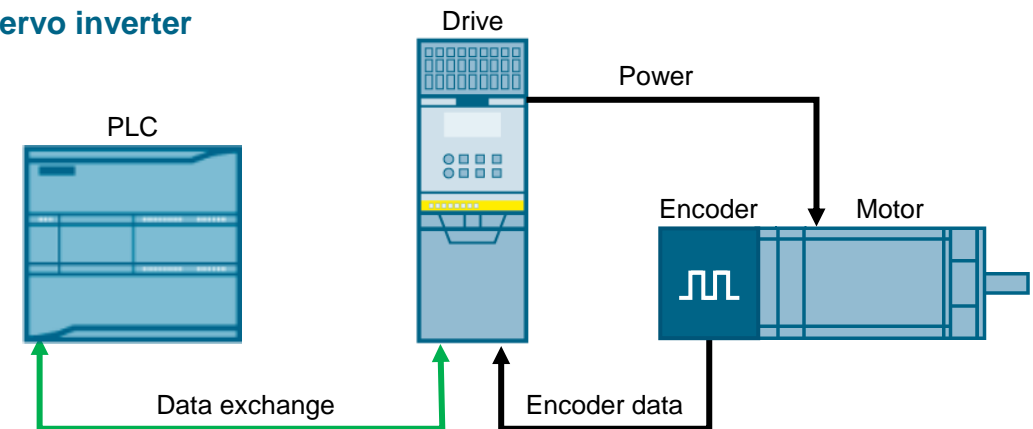
- For versatile control tasks
- Auto-configuration of the PID control loop parameters
- Easy-to-configure screens
- Easy Commissioning screens with integrated trace

Integrated Motion Control

- Basic Position and Speed control
- Easy-to-configure screens
- Control via integrated Pulse-Train Outputs (PTO)
- Control via PROFIdrive profile (PROFINET / PROFIBUS)
- Control via Analog outputs



Servo inverter



SIMATIC Integrated Technology

Advanced Technology in a compact form

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Predictive Maintenance with SM 1281

- SIPLUS CMS 1200 Condition Monitoring System
 - Recording and analysis of vibrations
 - Frequency-selective analysis using FFT, H-FFT, trend analysis, and more...

Weighing with SIWAREX

- SIWAREX WP231 for load cells
- SIWAREX WP241 for belt scales
- SIWAREX WP251 for dosing and filling processes

Energy Metering with SM 1238

- Data acquisition of electrical characteristics in 1 and 3-phase networks up to 480 V AC
- Current measurement performed by 1 A and 5 A current transformers



Integrated system diagnostics

Configuring instead of programming

- Active by default
- Automated updated of the diagnostics information with new HW components
- System diagnostics information possible in the CPU-STOP

Uniform display concept

- Uniform clear text information
 - Access from TIA Portal, Webserver, HMI & SIMATIC Automation Tool



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Configuring instead of programming

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Uniform display concept

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Safety integrated – Failsafe CPUs for standard and safety applications

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Failsafe CPUs Features

- Standard and fail-safe automation with just one controller (no safety partner required)
- Profisafe Integrated
- Meets international safety standards:
 - EN 61508 up to SIL 3
 - EN ISO 13849-1 up to PLe
- Extend existing system simply with Safety
- Additional password protection for Failsafe configuration and Failsafe program
- Integrated Failsafe Diagnostics
- TUV certified



Why wait
...when getting started is so easy?

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Our starter kits are the perfect base for a fast and easy start!

Starter Kit S7-1200:



SIMATIC Controller

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