

# SIMATIC S7-1200

## Introduction

### SIMATIC S7-1200

#### Overview



- The new modular miniature controller from the SIMATIC S7 family
- Consisting of:
  - controller with integrated PROFINET interface for communication with programming device, HMI or other SIMATIC controllers
  - powerful, integrated technology functions such as counting, measuring, closed-loop control, and motion control
  - integrated digital and analog inputs/outputs
  - signal boards for direct use in a controller
  - signal modules for expansion of controllers by input/output channels
  - communication modules for expansion of controllers by communications interfaces
  - accessories, e.g. power supply, switch module or SIMATIC Memory Card
- The miniature controller that offers maximum automation at minimum cost
- Extremely simple installation, programming and operation
- Large-scale integration, space-saving, powerful
- Suitable for small to medium-size automation engineering applications
- Can be used both for simple controls and for complex automation tasks
- All CPUs can be used in stand-alone mode, in networks and within distributed structures
- Suitable for applications where programmable controllers would not have been economically viable in the past
- With exceptional real-time performance and powerful communication options

#### Application

The SIMATIC S7-1200 is the controller for open-loop and closed-loop control tasks in mechanical equipment manufacture and plant construction. It combines maximum automation and minimum cost.

Due to the compact modular design with a high performance at the same time, the SIMATIC S7-1200 is suitable for a wide variety of automation applications. Its range of use extends from the replacement of relays and contactors up to complex automation tasks in networks and within distributed structures.

The S7-1200 also increasingly opens up areas for which special electronics was previously developed for economical reasons.

Application examples include, for example:

- Placement systems
- Conveyor systems
- Elevators and escalators
- Material transportation equipment
- Metalworking machinery
- Packaging machines
- Printing machines
- Textile machines
- Mixing systems
- Freshwater treatment plants
- Wastewater treatment plants
- External displays
- Electricity distribution stations
- Room temperature control
- Heating/cooling system control
- Energy management
- Fire protection systems
- Air conditioning
- Lighting control
- Pump control
- Security/access control systems

#### Design

The SIMATIC S7-1200 family consists of the following modules:

- 3 compact controllers with graded performances in different versions as wide-range AC or DC controllers
- 2 signal boards (analog and digital) for low-cost modular controller expansion directly on the CPU, with retention of the mounting space
- 13 different digital and analog signal modules
- 2 communication modules (RS232/RS485) for communication via point-to-point connection
- Ethernet switch with 4 ports for implementation of many different network topologies
- PS 1207 stabilized power supply units, line voltage 115/230 V AC, rated voltage 24 V DC

#### Mechanical features

- Rugged, compact plastic enclosure
- Easily accessible connection and control elements, protected by front flaps
- Removable connection terminals, also for analog or digital expansion modules

#### Device features

- International standards:  
SIMATIC S7-1200 complies with the standards according to VDE, UL, CSA and FM (Class I, Category 2; Danger zone groups A, B, C and D, T4A). The quality management system used during production is certified according to ISO 9001.

### Design (continued)

#### Communication

The SIMATIC S7-1200 is equipped with different communication mechanisms:

- Integral PROFINET interface
- Point-to-point connection via communication modules

#### PROFINET interface

The integral PROFINET interface permits communication with:

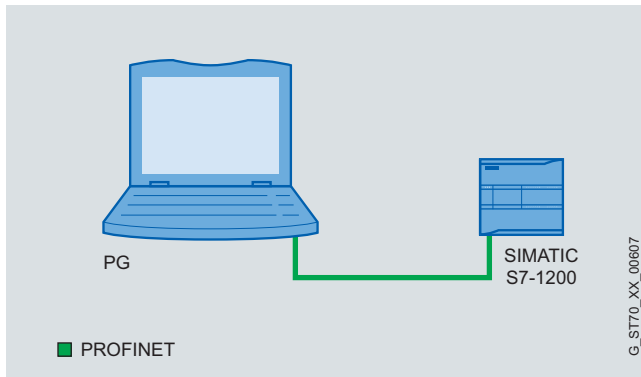
- Programming device
- HMI devices
- Other SIMATIC controllers

The following protocols are supported:

- TCP/IP
- ISO-on-TCP
- S7 communication

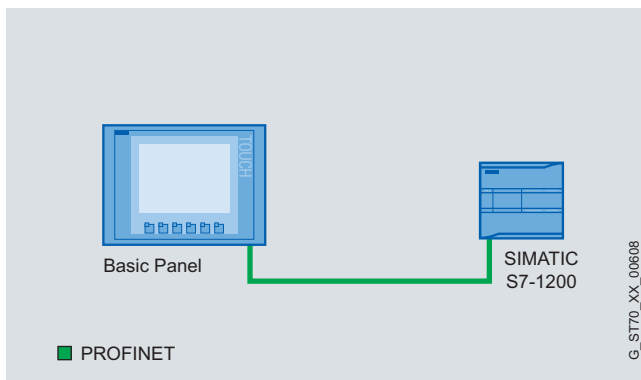
The following can be connected:

Field PG programming device and PCs via standard CAT5 cable.



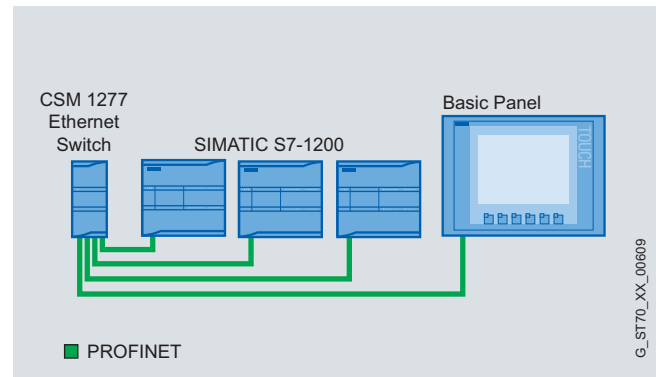
Connection between PG and CPU of SIMATIC S7-1200

- SIMATIC HMI Basic Panels



Connection between Basic Panel and CPU of SIMATIC S7-1200

- Further SIMATIC S7-1200 controllers

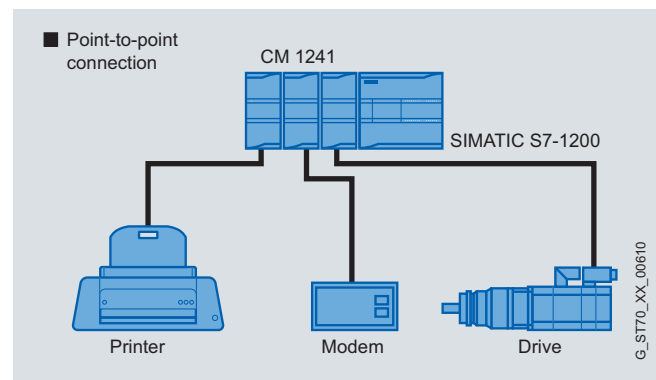


Connection of several devices via CSM 1277 Ethernet switch

#### Point-to-point interface, freely-programmable interface mode

Communication modules permit communication via point-to-point connections. The RS232 and RS485 physical transmission media are used. Data transmission is carried out in the "Freeport" mode of the CPU. A user-specific, bit-oriented communication protocol is used (e.g. ASCII protocol, USS, or MODBUS).

Any terminal equipment with a serial interface can be connected, e.g. drives, printers, bar code readers, modems, etc.



Point-to-point connection via CM 1241 in programmable interface mode

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#### Function

The S7-1200 is characterized by:

- Extremely simple starter solution: Special starter packages and introductions facilitate familiarization.
- Uncomplicated operation: Powerful standard commands which are simple to use, together with the user-friendly programming software, reduce the programming overhead to a minimum.
- Exceptional real-time characteristics: Special interrupt functions, fast counters, and pulse outputs permit use even with time-critical processes.
- Powerful communication options: Particularly with the optional PROFIBUS DP connection, the S7-1200 can fully utilize its performance capability for distributed automation solutions.

The SIMATIC S7-1200 meets national and international standards:

- UL 508
- CSA C22.2 No. 142
- FM Class I, div. 2, group A, B, C, D; T4A Class I, Zone 2, IIC, T4
- VDE 0160
- EN 61131-2
- Requirements of the EMC directive in accordance with EN 50081-1, 50081-2 and 50082-2

#### Technical specifications

##### General technical specifications

Degree of protection	IP20 acc. to IEC 529
Ambient temperature	<ul style="list-style-type: none"> <li>• Operation (95% humidity)               <ul style="list-style-type: none"> <li>- horizontal installation 0 ... 55 °C</li> <li>- vertical installation 0 ... 45 °C</li> </ul> </li> <li>• Transportation and storage               <ul style="list-style-type: none"> <li>- with 95% humidity 25 ... 55 °C</li> </ul> </li> </ul>
Insulation	<ul style="list-style-type: none"> <li>• 5/24 V DC circuits 500 V AC test voltage</li> <li>• 115/230 V AC circuits to ground 1500 V AC test voltage</li> <li>• 115/230 V AC circuits to 115/230 V AC circuits 1500 V AC test voltage</li> <li>• 230 V AC circuits to 5/24 V DC circuits 1500 V AC test voltage</li> <li>• 115 V AC circuits to 5/24 V DC circuits 1500 V AC test voltage</li> </ul>
Electromagnetic compatibility	Requirements of the EMC directive <ul style="list-style-type: none"> <li>• Noise immunity acc. to EN 50082-2               <ul style="list-style-type: none"> <li>Test acc. to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160</li> </ul> </li> <li>• Emitted interference acc. to EN 50081-1 and EN 50081-2               <ul style="list-style-type: none"> <li>Test acc. to EN 55011, Class A, Group 1</li> </ul> </li> </ul>
Mechanical strength	<ul style="list-style-type: none"> <li>• Vibrations, test acc. to / tested with               <ul style="list-style-type: none"> <li>IEC 68, Part 2-6: 10 ... 57 Hz; constant amplitude 0.3 mm; 58 ... 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in switchboard); mode of vibration: frequency sweeps with a sweep rate of 1 octave/minute; duration of vibration: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes</li> </ul> </li> <li>• Shocks, test acc. to / tested with               <ul style="list-style-type: none"> <li>IEC 68, Part 2-27/half-sine: magnitude of shock 15 g (peak value), duration 11 ms, 6 shocks in each of the three mutually perpendicular axes</li> </ul> </li> </ul>

#### More information

##### Brochures

Information material for downloading can be found in the Internet:

<http://www.siemens.com/simatic/printmaterial>