

SIMOTION Motion Control system - SIMOTION C - Controller-based



Overview

SIMOTION C is the modular controller variant of the SIMOTION family with the proven design of the SIMATIC S7-300 with its simple expansion options. Both SIMOTION C230-2 and C240 designs represent two powerful motion controllers for advanced control and motion control tasks.

HMI devices can be operated directly on the onboard PROFIBUS or Ethernet interface for operator control and monitoring. Functions such as remote maintenance, diagnostics and teleservice can also be used via these interfaces.

Benefits

- Can be flexibly used due to the SIMATIC S7 module range and thus optimal adaptation to automation task
- For universal use with digital and analog servo drives or stepper drives
- User-friendly handling and uncomplicated design without a fan
- Versatile networking due to on board PROFIBUS DP and Industrial Ethernet interfaces

- Powerful due to a range of integrated functions
- Simple engineering of open-loop control and Motion Control applications within the same program

Application

SIMOTION C can be used wherever

- Motion Control, technology and control functionalities are to be programmed, parameterized and executed as a unit
- A modular expandable device is to be placed near or in the machine
- Communication with other programmable controllers is necessary

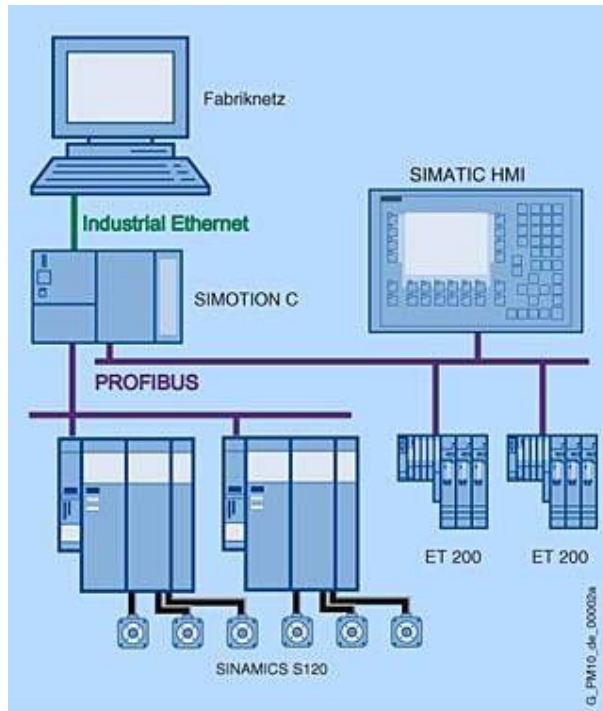
SIMOTION C is universally applicable and meets the highest standards with respect to suitability for industrial use, due to high EMC compatibility and resistance against shock and vibration loads.

Main applications are:

- Packaging machinery
- Plastic and rubber processing machinery
- Presses, wire-drawing machinery
- Textile machinery
- Printing machinery
- Wood, glass, ceramic, and stone working machinery
- Retrofitting

Due to the increasing use of servo drives, such machinery requires integrated logic, Motion Control and technology functions.

Design



SIMOTION C with central and distributed I/O

The Motion Control system SIMOTION C is designed to be modular. It comprises a comprehensive module range which uses components of the SIMATIC S7-300 series and from drive technology.

Components and interfaces of the SIMOTION C Motion Controller:

- Analog drive interfaces for setpoint output for servo drives
- Pulse outputs for controlling stepper drives
- Interfaces for incremental/absolute encoders for cyclic detection of actual position values
- On board I/O for especially fast I/O signals
- SIMOTION Micro Memory Card (MMC) for storing:
 - SIMOTION Kernel
 - User programs
 - User variables
- Integrated communication ports for linking:
 - Distributed I/Os

- HMI systems
- PG/PC
- Other Motion Control and automation systems
- Drives with digital setpoint interface
- Various status/error displays and mode selectors

The following components comprise a SIMOTION C system:

- Motion Controller and Micro Memory Card
- If required, further system components, such as:
 - Load power supplies (PS) for connecting SIMOTION C to a power supply of 120 V/230 V AC
 - Central (not on board) and distributed I/O components
 - Servo drives with analog or digital setpoint interface or stepper drives

Design technology

The simple design technology makes SIMOTION C flexible and easy to service:

- Module mounting
Simply attach the module to the standard mounting rail, swing it in and screw it tight.
- Integrated backplane bus
The backplane bus is integrated in the Motion Controller. The Motion Controller is connected to the I/O Modules with bus connectors which are plugged into the rear of the housing.
- The front connector coding prevents front connectors from being plugged into the wrong module type.
- Screw-type or spring-loaded terminals for I/O Modules
- TOP connect
This connection method provides pre-assembled wiring with 1 to 3-wire connection systems with screw-type or spring-loaded terminal as an alternative to wiring directly on the I/O Module.
- This system uses a defined mounting depth since all connections and connectors are recessed in the module and are protected and covered by doors on the front.

- No slot rules.

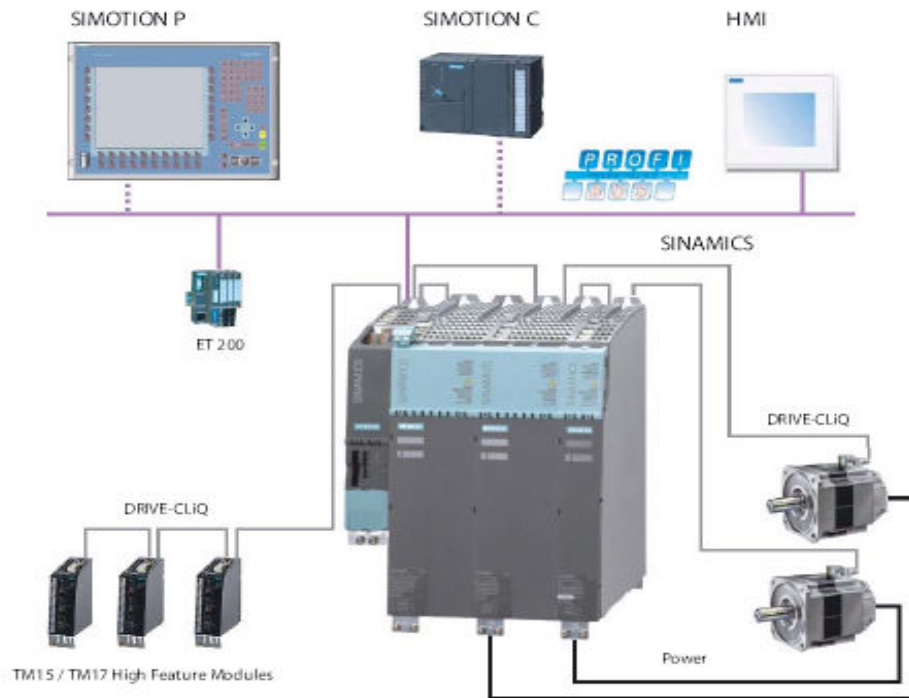
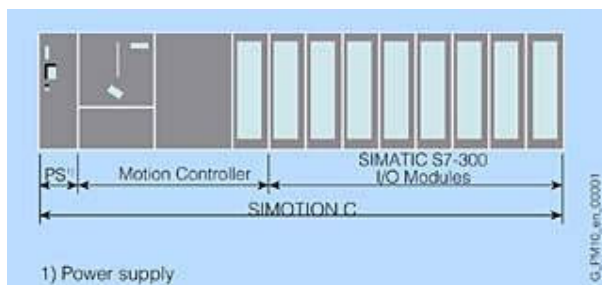


Figure 1-2 Integration of TM15/TM17 High Feature with SIMOTION C or P

Expansion

Up to 8 slots can be used to the right of the Motion Controller in the main unit for SIMATIC S7-300 I/O Modules.

The IM 365 can be used to connect an expansion rack (two-tier design) to increase the number of slots available for I/O Modules from 8 to 16. Multitier configuration with IM 360/IM 361 is not supported by SIMOTION C.



SIMOTION C can be mounted horizontally or vertically.

If additional I/O Modules are required, the distributed SIMATIC ET 200 I/O can be connected to the Motion Controller over PROFIBUS DP.

The number of pluggable I/O Modules is also limited by the power required from the backplane bus. The power consumption of all modules which are connected to the same backplane bus must not exceed 1.2 A.

Expansion using distributed I/Os

Distributed I/Os can be assembled with intelligent I/O system components:

- SIMATIC ET 200S
- SIMATIC ET 200M
- SIMATIC ET 200X
- SIMATIC ET 200pro
- SIMATIC ET 200eco

Function

SIMOTION C provides the following basic functionality for the various automation requirements:

- SIMOTION runtime system
 - Programmable with several languages conforming to IEC 61131
 - Various runtime levels (cyclic, sequential, event-driven)
 - PLC and arithmetic functionality
 - Communications and management functions
 - Motion control functions (Motion Control Basic)
- Test and diagnostic interfaces

This basic functionality can be expanded, for example, with loadable technology packages, if required.

Technology packages (TP)

A special feature of SIMOTION is that the operating system functionality can be expanded by loading technology packages, such as:

- Motion control with the functions:
 - Positioning - POS
 - Synchronous operation/electronic gear - GEAR
 - Cam - CAM
- Temperature controller - TControl

Since the technology functions have modular licenses, you only pay for what you use.

Configuring/parameterizing/programming

SIMOTION SCOUT is a powerful and user-friendly engineering tool. It is an integrated system for all engineering steps, from configuring and parameterization, through programming, to testing and diagnostics. Graphical operator prompting, using technological dialog boxes and wizards, as well as textual and graphical languages for programming, considerably reduce the familiarization and training periods.

Operator control and monitoring (HMI)

Communication utilities which support user-friendly data exchange with HMI devices are integrated in the basic functionality of the SIMOTION C controller. Operator control and monitoring can be implemented using SIMATIC HMI devices, such as TPs (Touch Panels), OPs (Operator Panels) or MPs (Multi Panels).

These devices can be connected via PROFIBUS or Ethernet interfaces, and are configured using ProTool/Pro or WinCC flexible.

With the SIMATIC NET communications software, the open, standardized OPC interface is available for accessing SIMOTION from other Windows-based HMI systems.

Communication

Thanks to its integrated interfaces, SIMOTION C supports both process and data communication. The SCOUT engineering system is provided for user-friendly communication configuration and diagnosis.