All information you need ... On one click!

<table>
<thead>
<tr>
<th>All news around SIMOCODE pro</th>
<th>All about SIMOCODE pro Safety</th>
<th>All about SIMOCODE pro PROFINET</th>
<th>All about the software of SIMOCODE pro</th>
<th>All about the use in practice of SIMOCODE pro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Click the picture</td>
<td>Click the picture</td>
<td>Click the picture</td>
<td>Click the picture</td>
<td>Click the picture</td>
</tr>
</tbody>
</table>

To see the complete slides: please continue with the presentation
SIMOCODE pro technical slides

- Introduction 3
- System 12
- Product 16
- Customer benefits 53
- Added value 57
- Migration 89
- Service, support, and training 92
- Applications and references 97
- Ordering data and logistics 107
SIMOCODE pro is your reliable partner for all-encompassing motor management

Introduction

Plant downtimes prove to be extremely costly in many automated processes.

With use of the right technology, it is possible to prevent process disruptions or to lessen their duration when they do occur.

New market demands, including increased use of power management systems and status-based motor monitoring, led to the leading motor management system on the market: SIMOCODE pro.
SIMOCODE pro establishes the connection between the automation level and the motor

Introduction

- Process control
- Operations management

- Maintenance
- Power management
SIMOCODE pro integrates all functions required for the motor feeder in a single system

Introduction

SIMOCODE pro provides flexible control and comprehensive protection of motors and applications:

- **Multifunctional, electronic full motor protection**
- **Extensive motor control functions**
- **First motor management system** on the market with integrated safety technology
- **Communication** via PROFINET IO and PROFIBUS DP
- **Detailed operating, service, and diagnostics data**
  - including via OPC UA and integrated web server
- **Easy engineering with SIMOCODE ES V12** (TIA Portal) and SIMOCODE ES 2007
The SIMOCODE success story: Successful for decades thanks to innovations

Introduction

More than 25 years experience with motor management systems
The functions of a conventional motor feeder in the switchboard

Introduction
Potential for improvements to the conventional motor feeder

Introduction

- Only basic protection!
- Few data (information)!
- Large space requirement and wiring effort!
Significant advantages of the motor feeder design with SIMOCODE pro

Introduction

Advantages
- Compact dimensions and modular design
  ➔ Space-saving
- More protection and monitoring
  ➔ Broad functional scope
- Software-based control circuit
  ➔ Less wiring
- Ten times more data and information per feeder

Automation

Main circuit

Control circuit

Protecting + monitoring

Communication

Controlling

SIMOCODE pro
## SIMOCODE pro technical slides

### Table of Contents

- **Introduction**  4
- **System**  11
- **Product**  16
- **Customer benefits**  53
- **Added value**  57
- **Migration**  89
- **Service, support, and training**  92
- **Applications and references**  97
- **Ordering data and logistics**  107
SIMOCODE pro: A versatile system

Top highlights at a glance

- Universal system for all low-voltage constant-speed motors
- Very flexible thanks to modular expandability
- Integration into leading process control systems
- Open communication via web server/internal diagnostics
- Efficient and intuitive engineering
- Integrated safety technology
SIMOCODE pro: From smart and compact to variable and intelligent

System – Product portfolio

**SIMOCODE pro S**
Smart and compact

**SIMOCODE pro V**
Variable and intelligent

**SIMOCODE pro V PN**

PROFIBUS DP

PROFINET IO
Two device types, one system: Customized motor management

System – Overview

SIMOCODE pro S is the **cost-effective, multifunction entry-level** motor management solution.

SIMOCODE pro V is one of the **most powerful motor management systems** on the market.
SIMOCODE pro: Powerful hardware and innovative software

Product – Overview
SIMOCODE pro: Powerful hardware and innovative software

Product – Overview

Components
- pro S
- pro V

Expansion modules, accessories

Functions

Communication

Engineering, integration, maintenance
### Components – Overview of SIMOCODE pro S

<table>
<thead>
<tr>
<th>Basic unit</th>
<th>Multifunction module</th>
<th>Current measuring module</th>
<th>Residual current transformer 3UL23</th>
<th>Operator panel</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Basic unit image" /></td>
<td><img src="image2.png" alt="Multifunction module image" /></td>
<td><img src="image3.png" alt="Current measuring module image" /></td>
<td><img src="image4.png" alt="Residual current transformer image" /></td>
<td><img src="image5.png" alt="Operator panel image" /></td>
</tr>
</tbody>
</table>

- **Basic unit**
  - 4 DI and 2 DO
  - Thermistor
  - PROFIBUS DP 1.5 Mbps
  - Supply voltage 24 V DC or 110-240 V AC/DC
  - Terminals for bus connection

- **Multifunction module**
  - 4 DI and 2 DO
  - Connection for temperature sensor
  - External earth-fault monitoring via residual current transformer 3UL23
  - Inputs with 24 V DC or 110-240 V AC/DC

- **Current measuring module**
  - 0.3 A to 630 A
  - Straight-through technology/busbar connection

- **Residual current transformer 3UL23**
  - 6 designs with opening diameter from 35 to 210 mm
  - Current range 0.03 to 40 A

- **Operator panel**
  - 10 LEDs
  - 5 keys
Additional functions of the multifunction module in detail

Components – Multifunction module for SIMOCODE pro S

One multifunction module can be connected to the basic unit.

<table>
<thead>
<tr>
<th>Multifunction module</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Additional 4 digital inputs, externally supplied with 24 V DC or 110-240 V AC/DC</td>
</tr>
<tr>
<td>• Additional 2 monostable relay outputs</td>
</tr>
<tr>
<td>• Earth-fault monitoring with the 3UL23 residual current transformer in the range from 30mA to 40A</td>
</tr>
<tr>
<td>• Temperature monitoring of one analog temperature sensor, e.g., for motor temperature or temperature of process variables (sensors that can be connected: Pt100, Pt1000, KTY, NTC)</td>
</tr>
</tbody>
</table>
Intelligent motor feeder including safety technology – by combining suitable components

Components – Overview of SIMOCODE pro V

<table>
<thead>
<tr>
<th>Basic unit</th>
<th>Expansion module</th>
<th>Current or current/voltage measuring module</th>
<th>Residual current transformer 3UL23</th>
<th>Operator panel with display</th>
</tr>
</thead>
</table>

- 4 DI and 3 DO
- Thermistor
- PROFIBUS DP 12 Mbps or
- PROFINET IO 100 Mbps
- Supply voltage 24 V DC or 110-240 V AC/DC
- Bus connection via terminals or D-sub connector

- Fail-safe digital module
- Digital I/Os
- Analog I/Os
- Temperature input
- External earth-fault monitoring via residual current transformer

- 0.3 A to 630 A
- 110 V - 690 V *
- Straight-through technology/ busbar connection

- 6 designs with opening diameter from 35 to 210 mm
- Current range 0.03 to 40 A

- Multilingual display
- 7 LEDs
- 4 keys

* Current/voltage measuring modules only
Additional functions of the expansion modules in detail: Temperature and analog value monitoring

Components – Expansion modules for SIMOCODE pro V

Temperature module
Temperature monitoring of up to three analog temperature sensors, e.g., for motor temperature or temperature of process variables

- Sensors that can be connected: Pt100, Pt1000, KTY, NTC
- *) Temperature module can be connected

Analog module
Input/output and monitoring of analog signals (0/4-20 mA), e.g., for fill level/flow monitoring or for control of a display device

- 2 analog inputs
- 1 analog output
- *) Analog module can be connected

*) Up to 2 modules for SIMOCODE pro V PROFINET
Additional functions of the expansion modules in detail: Additional I/O and precise earth-fault detection

Components – Expansion modules for SIMOCODE pro V

**Digital modules**

- Additional 4 digital inputs and 2 relay outputs
- Selectable monostable or bistable relay outputs
- Externally supplied inputs with 24 V DC or 110-240 V AC/DC
- Up to two digital modules can be connected

**Earth-fault detection module**

- Expansion of internal earth-fault monitoring to include external detection with the 3UL23 residual current transformer
- Measurement of earth-fault current
- Adjustable warning and tripping thresholds in the range from 30 mA to 40 A
- 1 earth-fault detection module can be connected
Precise earth-fault detection for high plant availability

Components – Residual current transformer for SIMOCODE pro

**Residual current transformer in combination with multifunction module or earth-fault detection module**

- Measurement and communication of earth-fault current to the control system
- Assignable warning and tripping thresholds in the range from 30 mA to 40 A
- High measuring accuracy (accuracy of ± 7.5%)
- Continuous monitoring for wire break and short circuit between the transformer and the evaluation module
- 1 transformer per feed-through opening, opening diameter: 35 mm, 55 mm, 80 mm, 110 mm, 140 mm, and 210 mm

**Benefits**

- Higher plant availability as a result of separate warning and tripping thresholds
- Detection of insulation deterioration in the maintenance station
- Reduced inventory due to fewer variants
- Price advantage because combination of transformer and earth-fault detection module is cheaper than before
Expanding SIMOCODE pro V with safety technology: SIMOCODE pro Safety

Components – Expansion modules for SIMOCODE pro V

**DM-F Local fail-safe digital module**

For local applications or integration in controllers without PROFIsafe
- Safety-related shutdown based on an Emergency Stop sensor or a signal of a fail-safe controller without PROFIsafe
- Parameter assignment of the safety function via DIP switch on DM-F LOCAL
- Diagnostic information available in SIMOCODE ES as standard signals
- Safety function up to SIL 3 / PL e with Category 4

**DM-F PROFIsafe fail-safe digital module**

For decentralized, distributed applications with PROFIsafe
- Safety-related shutdown based on PROFIsafe signal from the F-PLC
- DIP switch on DM-F PROFIsafe for setting the PROFIsafe address
- PROFIsafe frame evaluation in the DM-F – does not utilize the SIMOCODE basic unit
- Safety function up to SIL 3 / PL e with Category 4
Motor management system for all low voltage motors up to 630 A

Components – Current measuring modules and current/voltage measuring modules for SIMOCODE pro

<table>
<thead>
<tr>
<th>Widths</th>
<th>45 mm</th>
<th>55 mm</th>
<th>120 mm</th>
<th>145 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 A to 3 A **</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 A to 25 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110 V to 690 V *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 A to 100 A</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>20 A to 200 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63 A to 630 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110 V to 690 V *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Current/voltage measuring modules only
** Up to 820 A with 3UF18 intermediate transformers
Small supplementary devices that save time and make handling easier

Components – Accessories for SIMOCODE pro

<table>
<thead>
<tr>
<th>Addressing plug</th>
<th>Assignment of a PROFIBUS address to one or more basic units without a PC or programming device</th>
</tr>
</thead>
</table>
| Memory module   | • For parameter assignment or device replacement without a PC or programming device  
                  • Motor feeder commissioning in a matter of seconds |
| Initialization module | • For automatic addressing and parameter assignment after device replacement  
                           • Plug & play in the switchboard without expert know-how |
SIMOCODE pro: Powerful hardware and innovative software

Product – Overview
The right component for every function

Functions – Assignment to components

<table>
<thead>
<tr>
<th>Functions</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Simple control functions (e.g., overload relay, direct start and reversing start, soft start*, star-delta*)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Expanded control functions (e.g., pole-changing switch, slide)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Simple monitoring functions (e.g., current limits, internal earth-fault, downtimes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Protection functions (e.g., thermistor, overload, phase asymmetry)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Current measurement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Voltage/power measurement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 External earth-fault monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Temperature monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Analog value monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Safety-related shutdown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Basic unit with multifunction module with digital modules</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pro S 4 inputs/2 outputs max. 8 inputs/4 outputs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pro V 4 inputs/3 outputs max. 12 inputs/7 outputs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Expansion I/Os, input voltage 24 V DC, 110-240 V AC/DC, monostable relay outputs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Expansion I/Os, input voltage 24 V DC, 110-240 V AC/DC, bistable relay outputs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* With additional multifunction module for SIMOCODE pro S

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Page 28 15.11.2013
## Function overview of SIMOCODE pro V and pro S

### Functions – Comparison of SIMOCODE pro V and SIMOCODE pro S

<table>
<thead>
<tr>
<th>Functions</th>
<th>SIMOCODE pro V</th>
<th>SIMOCODE pro S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SIMOCODE pro V</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple control functions</td>
<td>(e.g. overload relay, direct start and reversing start, soft start*, star-delta*)</td>
<td></td>
</tr>
<tr>
<td>Protective functions</td>
<td>(e.g. thermistor, overload, phase asymmetry)</td>
<td></td>
</tr>
<tr>
<td>Simple monitoring functions</td>
<td>(e.g. current limits, internal ground fault, idle times)</td>
<td></td>
</tr>
<tr>
<td>Basic unit</td>
<td>4 inputs / 2 outputs</td>
<td>Basic 4 inputs / 3 outputs</td>
</tr>
<tr>
<td>Basic unit with digital module</td>
<td>max. 12 inputs / 7 outputs</td>
<td>Basic unit with digital module</td>
</tr>
<tr>
<td></td>
<td>max. 8 inputs / 4 outputs</td>
<td></td>
</tr>
<tr>
<td>Current measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External earth-fault monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion I/Os</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input voltage 24 V DC, 110-240 V AC/DC, monostable relay outputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expanded control functions</td>
<td>(e.g. pole-changing starter, positioner)</td>
<td></td>
</tr>
<tr>
<td>Voltage / power measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog value monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety-related disconnection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion I/Os</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input voltage 24 V DC, 110-240 V AC/DC, bistable relay outputs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* With additional multifunction module for SIMOCODE pro S

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Choose the system with the right functions for you

## Functions – Function comparison of SIMOCODE pro C, pro S, and pro V

<table>
<thead>
<tr>
<th>Protection functions</th>
<th>pro C</th>
<th>pro S</th>
<th>pro V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overload protection (class)</td>
<td>5, 10, 15, 20, 25, 30, 35, 40</td>
<td>5, 10, 15, 20, 25, 30, 35, 40</td>
<td>5, 10, 15, 20, 25, 30, 35, 40</td>
</tr>
<tr>
<td>Max. rated current</td>
<td>630 A</td>
<td>630 A</td>
<td>630 A</td>
</tr>
<tr>
<td>Thermistor motor protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase failure monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asymmetry monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocking protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earth-fault monitoring (internal, without additional transformer)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earth-fault monitoring with residual current transformer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring of operating hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring of downtimes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring of number of starts</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Choose the system with the right functions for you

Functions – Function comparison of SIMOCODE pro C, pro S, and pro V

<table>
<thead>
<tr>
<th>Expanded monitoring functions via expansion modules</th>
<th>pro C</th>
<th>pro S</th>
<th>pro V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety-related motor shutdown</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Temperature monitoring Pt100/ Pt1000</td>
<td></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Voltage monitoring</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Power monitoring</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Power factor monitoring</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Phase sequence detection</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Input, output, and monitoring (0/4-20 mA) signal</td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>
Choose the system with the right functions for you

Functions – Function comparison of SIMOCODE pro C, pro S, and pro V

<table>
<thead>
<tr>
<th>Control functions</th>
<th>pro C</th>
<th>pro S</th>
<th>pro V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct starter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reversing starter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Star-delta (wye-delta) starter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Star-delta (wye-delta) starter with direction reversal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 speeds (Dahlander), also with direction reversal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slide control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control of a circuit breaker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control of a soft starter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control of a soft starter with reversing contactor</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Can be flexibly adapted with ...

<table>
<thead>
<tr>
<th>Can be flexibly adapted with ...</th>
<th>pro C</th>
<th>pro S</th>
<th>pro V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logic modules (truth tables, counters, timers, edge evaluation, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard functions (power failure monitoring, emergency start, external errors, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Functions –
Basic unit pro S

<table>
<thead>
<tr>
<th>Functions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Simple control functions (e.g., overload relay, direct start and reversing start)</td>
</tr>
<tr>
<td>3</td>
<td>Simple monitoring functions (e.g., current limits, internal earth-fault, downtimes)</td>
</tr>
<tr>
<td>4</td>
<td>Protection functions (e.g., thermistor, overload, phase asymmetry)</td>
</tr>
<tr>
<td>5</td>
<td>Current measurement</td>
</tr>
<tr>
<td>11</td>
<td>4 inputs/2 outputs</td>
</tr>
</tbody>
</table>
SIMOCODE pro S: Multifunction module for common additional requirements

Functions – Basic unit pro S plus multifunction module

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Simple control functions (e.g., overload relay, direct start and reversing start, soft start, star-delta)</td>
</tr>
<tr>
<td>3</td>
<td>Simple monitoring functions (e.g., current limits, internal earth-fault, downtimes)</td>
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<td>4</td>
<td>Protection functions (e.g., thermistor, overload, phase asymmetry)</td>
</tr>
<tr>
<td>5</td>
<td>Current measurement</td>
</tr>
<tr>
<td>7</td>
<td>External earth-fault monitoring</td>
</tr>
<tr>
<td>8</td>
<td>Temperature monitoring</td>
</tr>
<tr>
<td>11</td>
<td>Max. 8 inputs/4 outputs</td>
</tr>
<tr>
<td>12</td>
<td>Expansion I/Os, input voltage 24 V DC, 110-240 V AC/DC, monostable relay outputs</td>
</tr>
</tbody>
</table>
SIMOCODE pro V: The basic unit for all applications

Functions –
Basic unit pro V

<table>
<thead>
<tr>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>11</td>
</tr>
</tbody>
</table>
SIMOCODE pro V: Expansion modules for comprehensive additional requirements

Functions –
Basic unit pro V plus expansion module

<table>
<thead>
<tr>
<th>Functions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Simple control functions (e.g., overload relay, direct start and reversing start, soft start, star-delta)</td>
<td></td>
</tr>
<tr>
<td>2  Expanded control functions (e.g., pole-changing switch, slide)</td>
<td></td>
</tr>
<tr>
<td>3  Simple monitoring functions (e.g., current limits, internal earth-fault, downtimes)</td>
<td></td>
</tr>
<tr>
<td>4  Protection functions (e.g., thermistor, overload, phase asymmetry)</td>
<td></td>
</tr>
<tr>
<td>5  Current measurement</td>
<td></td>
</tr>
<tr>
<td>6  Voltage/power measurement</td>
<td></td>
</tr>
<tr>
<td>7  External earth-fault monitoring</td>
<td></td>
</tr>
<tr>
<td>8  Temperature monitoring</td>
<td></td>
</tr>
<tr>
<td>9  Analog value monitoring</td>
<td></td>
</tr>
<tr>
<td>10 Safety-related shutdown</td>
<td></td>
</tr>
<tr>
<td>11 Max. 12 inputs/7 outputs</td>
<td></td>
</tr>
<tr>
<td>12 Expansion I/Os, input voltage 24 V DC, 110-240 V AC/DC, monostable relay outputs</td>
<td></td>
</tr>
<tr>
<td>13 Expansion I/Os, input voltage 24 V DC, 110-240 V AC/DC, bistable relay outputs</td>
<td></td>
</tr>
</tbody>
</table>
SIMOCODE pro: Powerful hardware and innovative software

Product – Overview

Components
- pro S
- pro V

Expansion modules, accessories

Functions

Communication

Engineering, integration, maintenance
Variety of communication mechanisms in the motor feeder

Communication

- **SIMOCODE pro S**
  - Smart and compact
  - PROFIBUS DP

- **SIMOCODE pro V**
  - Variable and intelligent
  - PROFIBUS DP

- **SIMOCODE pro V PN**
  - PROFINET IO
**SIMOCODE pro supports a variety of PROFIBUS mechanisms**

## Communication

<table>
<thead>
<tr>
<th>Communication via PROFIBUS</th>
<th>pro C</th>
<th>pro S</th>
<th>pro V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baud rates up to 1.5 Mbps (bus connection via terminal)</td>
<td>🟢</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Baud rates up to 12 Mbps (PROFIBUS connector)</td>
<td>🟢</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Automatic baud rate detection</td>
<td>🟢</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Cyclic services (DPV0) and acyclic services (DPV1)</td>
<td>🟢</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Operation downstream of Y-link as DPV1 slave</td>
<td>🟢</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Comprehensive diagnostics and hardware interrupts according to DPV1</td>
<td>🟢</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Time stamping of digital signals with high time accuracy</td>
<td></td>
<td></td>
<td>🟢</td>
</tr>
<tr>
<td>3UF50 compatibility mode</td>
<td></td>
<td></td>
<td>🟢</td>
</tr>
<tr>
<td>Fail-safe communication via PROFIsafe</td>
<td></td>
<td></td>
<td>🟢</td>
</tr>
</tbody>
</table>
PROFINET brings the convenience of real-time clock, web server, and OPC UA to the SIMOCODE world

Communication

<table>
<thead>
<tr>
<th>Communication via PROFINET</th>
<th>pro C</th>
<th>pro S</th>
<th>pro V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line and ring bus topologies thanks to integrated 2-port switch</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Media redundancy via MRP protocol</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Fail-safe communication via PROFIsafe</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Pause function and measured values via PROFIenergy</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Module replacement without PC using neighborhood detection</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Operating, service, and diagnostics data via web browser</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>NTP-synchronized time</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Extensive diagnostics and maintenance alarms</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>OPC UA server function</td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>
SIMOCODE pro V for PROFINET opens up a variety of communication options

Communication – SIMOCODE pro V for PROFINET

- **Integrated Ethernet-based network structure** throughout the system
- **Simplified redundancy concepts** based on 2 integrated communication ports, optional ring structure with Media Redundancy Protocol (MRP)
- **OPC UA for open communication** with visualization and control systems
- **Web server** for direct device diagnostics via standard web browser; possibility for remote access and diagnostics without additional costs
- **Network-synchronized realtime clock** (NTP)
- **PROFIsafe profile: Safety solutions** with DM-F Local and DM-F PROFIsafe modules
- **PROFIenergy profile**: Availability of measured values for energy management and support of shutdown during breaks
New PROFINET-based communication functions

Communication – SIMOCODE pro V for PROFINET

Integration in the control system

Characteristics

- Additional basic type 3 20 bytes In / 6 bytes Out
- Expanded diagnostic capability: diagnostics and maintenance alarms
- Support of "module replacement without PC and memory medium" function
- PROFIsafe via PROFINET in connection with a fail-safe digital module
- PROFInenergy (pause, measured values)
SIMOCODE pro: Powerful hardware and innovative software

Product – Overview
SIMOCODE ES: Easy planning, high configuration assurance, easy plant operation

Engineering, integration, maintenance

**SIMOCODE ES V12 (TIA Portal)**
- Next software generation of SIMOCODE ES, based on the central **Totally Integrated Automation Portal** engineering framework
- For all SIMOCODE pro devices with PROFIBUS
- Support for PROFINET devices is in progress

**SIMOCODE ES 2007**
Proven software for configuring all SIMOCODE pro devices

*Parallel use is possible* when upgrading from SIMOCODE ES 2007 to SIMOCODE ES V12
SIMOCODE ES V12: Configuring made easy thanks to powerful editors

Engineering, integration, maintenance

Configure devices via drag & drop

Graphical configuration and interconnecting of function blocks in the graphic editor (CFC-based)

Clear adjustment of device parameter
SIMOCODE ES V12: Commissioning made easy thanks to straightforward online functions

Engineering, integration, maintenance

- Online monitoring of signal states in the graphic editor
- Online display of status messages and motor control
- Display of measured values and statistical data of the motor feeder
SIMOCODE ES V12: Diagnostics made easy thanks to descriptive message and measured value display

Engineering, integration, maintenance

Recording and evaluation of analog values (e.g., current, voltage, etc.) in the device

Online readout of SIMOCODE pro error memory and error log

Monitoring and modifying of SIMOCODE pro I/Os
Engineering from a central location thanks to SIMOCODE ES routing function

Engineering, integration, maintenance

SIMOCODE ES V12
SIMOCODE ES 2007
Ethernet / PROFINET IO

PROFIBUS DP

SIMATIC S7 with SIMOCODE pro as S7 module

SIMOCODE pro V
SIMOCODE pro S

SIMOCODE pro V PN
Only with SIMOCODE ES 2007 ¹)

¹) For SIMOCODE ES V12: in progress
SIMOCODE ES: Easy integration into SIMATIC PCS 7 using predefined faceplates

Engineering, integration, maintenance

- SIMOCODE ES
- SIMATIC PCS 7
SIMOCODE ES: Easy integration and configuration using convenient configuration tools

Engineering, integration, maintenance

- SIMOCODE ES
- SIMATIC PDM
SIMOCODE ES: Easy maintenance and energy management during the product life cycle

Engineering, integration, maintenance

- Power and energy data for SIMATIC / PCS 7 Powerrate
- SIMOCODE ES
SIMOCODE pro: Keeps an eye on the motor. And your system running.

Customer benefits

<table>
<thead>
<tr>
<th>Feature / Function</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multifunctional, electronic <strong>full motor protection</strong>, independently of the automation system</td>
<td><strong>Complete motor protection</strong> with one system and independently of higher-level control system</td>
</tr>
<tr>
<td><strong>Fail-safe shutdown</strong> of motors</td>
<td><strong>Same integration</strong> for safety-related requirements, as well</td>
</tr>
<tr>
<td>Integrated <strong>control functions</strong></td>
<td><strong>Little wiring effort</strong> and few components for motor control</td>
</tr>
<tr>
<td>Detailed <strong>operating, service, and diagnostics data</strong></td>
<td><strong>Descriptive information</strong> about the production process is always available</td>
</tr>
<tr>
<td><strong>Open communication</strong> via PROFIBUS or PROFINET</td>
<td><strong>Flexible use</strong> with a range of different controllers and control systems</td>
</tr>
</tbody>
</table>
### Customer benefits

<table>
<thead>
<tr>
<th>Feature / Function</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration of the most important motor control functions in the basic unit</td>
<td>Efficient entry to motor management for standard applications</td>
</tr>
<tr>
<td>Expansion of functionality via the multifunction module</td>
<td>Flexible solutions now also possible for entry-level applications</td>
</tr>
<tr>
<td>(e.g., ground-fault and temperature monitoring)</td>
<td>Increased system availability thanks to additional monitoring functions</td>
</tr>
<tr>
<td>Integration in the new, only 22.5 mm wide housing with detachable terminals</td>
<td>Less space is required in the control cabinet</td>
</tr>
<tr>
<td>Integration in the software SIMOCODE ES 2007 and V12 (TIA Portal)</td>
<td>Easy engineering, including in the TIA Portal</td>
</tr>
</tbody>
</table>
SIMOCODE pro V: Variable and intelligent

Customer benefits

<table>
<thead>
<tr>
<th>Feature / Function</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration of a large number of motor control functions in the basic unit</td>
<td>Use for all motor control functions</td>
</tr>
<tr>
<td>Additional functionality via expansion modules (additional analog module, more I/Os)</td>
<td>Additional motor and process variables can be monitored</td>
</tr>
<tr>
<td>Integrated safety technology</td>
<td>Fail-safe shutdown of motors is possible</td>
</tr>
<tr>
<td>Open communication via web server and OPC UA</td>
<td>Diagnostics via Web Browser, incorporation of data into the user's own HMI solutions</td>
</tr>
<tr>
<td>Connection to SIMATIC PCS 7 and SIMATIC PDM</td>
<td>Integration into leading process control systems</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td>System</td>
<td>12</td>
</tr>
<tr>
<td>Product</td>
<td>16</td>
</tr>
<tr>
<td>Customer benefits</td>
<td>53</td>
</tr>
<tr>
<td>Added value</td>
<td>56</td>
</tr>
<tr>
<td>Migration</td>
<td>89</td>
</tr>
<tr>
<td>Service, support, and training</td>
<td>92</td>
</tr>
<tr>
<td>Applications and references</td>
<td>97</td>
</tr>
<tr>
<td>Ordering data and logistics</td>
<td>107</td>
</tr>
</tbody>
</table>
SIMOCODE pro delivers more motor management

Added value topics – Overview

- Energy efficiency
- Maintenance
- Web server and OPC UA server
- Media redundancy
- SIMOCODE pro Safety
- TIA Portal
SIMOCODE pro for more motor management

Added value topics – Overview

- Energy efficiency
- Maintenance
- Web server and OPC UA server
- Media redundancy
- SIMOCODE pro Safety
- TIA Portal
SIMOCODE pro provides a valuable contribution to energy efficiency

Energy efficiency

**Identifying energy consumption:**
Transparent representation of energy consumption by acquiring and transmitting all operating and consumption data, such as *current, voltage, active power, energy consumption, motor temperature, etc.*

**Evaluating and implementing:**
Evaluation of measured energy values (e.g., limit monitoring) with export of local or central measures

**PROF1energy support**
Measured value and pause functions according to the PROF1energy profile
SIMOCODE pro for more motor management

Added value topics – Overview

- Energy efficiency
- Maintenance
- Web server and OPC UA server
- Media redundancy
- SIMOCODE pro Safety
- TIA Portal
SIMOCODE pro provides a valuable contribution to prevention and fast troubleshooting

Maintenance

**Preventive maintenance**
- Motor operating hours
- Number of motor starts and overload trips

**Monitoring of current motor status**
- Display of tripping reserve in the event of motor overload
- Earth-fault monitoring

**Monitoring of application**
- Limit monitoring for all operating and service data, e.g., active power
- Temperature and analog inputs for other process and motor variables
SIMOCODE pro for more motor management

Added value topics – Overview

- Energy efficiency
- Maintenance
- Web server and OPC UA server
- Media redundancy
- SIMOCODE pro Safety
- TIA Portal
Remote access to measured values and diagnostics via Ethernet and integrated web server

Web server and OPC UA server

**Web server**

- **PLC**
- **SIMOCODE ES STEP 7**
- **PC**
- **Web browser**

**Characteristics**
- Online functions known from SIMOCODE ES can be called up via a web browser
- Familiar user interface
- Remote diagnostics via Internet is possible
OPC UA Server supplies measured values and diagnostics via Ethernet to the user's own HMI visualization systems

Web server and OPC UA server

OPC UA server

Access to SIMOCODE pro data by means of PC or HMI applications via OPC UA

SIMOCODE pro V PN
Direct client-server communication via Ethernet without PLC

Web server and OPC UA server

Data access via web browser and OPC UA client

- PC
- Web browser
- Touch panel
- Access to web server
- Access to OPC UA data
- SIMOCODE pro V PN
- Industrial Ethernet / PROFINET IO

Functions
- Control of the motor feeder, e.g., via touch panel
- Diagnostic messages
- Measured values and statistical data
- IT security functions:
  - Authentication at user level
  - Encryption and signature

Advantage
- No PLC required because of direct client-server communication
- HMI panel as powerful operator panel for multiple SIMOCODE pro units
SIMOCODE pro for more motor management

Added value topics – Overview

- Energy efficiency
- Maintenance
- Web server and OPC UA server
- Media redundancy
- SIMOCODE pro Safety
- TIA Portal
Media redundancy

- Simplified system architecture as a result of integrated MRP function
- PROFINET devices support media redundancy
- Special ring management device is no longer required
- A PN device (e.g., controller, SCALANCE) takes the role of the redundancy manager automatically

Alternative communication path in the event of an error
Interruption-free communication in ring structures thanks to media redundancy protocol (MRP)

Media redundancy

- Communication is maintained in the event of an error.
- The second communication path is opened by the ring manager.
- The communication continues without interruption via the alternative communication path.
- The error is limited to the network segment where the error occurred.
MRP topology examples

Media redundancy

<table>
<thead>
<tr>
<th>Central ring with individual subsystems</th>
<th>Multiple local rings</th>
<th>Multiple local rings each on S7-400 CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Management</td>
<td>System Management</td>
<td>System Management</td>
</tr>
<tr>
<td>Subsystem 1</td>
<td>Subsystem 1</td>
<td>Subsystem 1</td>
</tr>
<tr>
<td>Subsystem n</td>
<td>Subsystem n</td>
<td>Subsystem n</td>
</tr>
</tbody>
</table>

Media redundancy
SIMOCODE pro for more motor management

Added value topics – Overview

- Energy efficiency
- Maintenance
- Web server and OPC UA server
- Media redundancy
- SIMOCODE pro Safety
- TIA Portal
SIMOCODE pro Safety: Motor management including safety functions without additional effort

SIMOCODE pro Safety – Overview

- Easy implementation of safety-related solution with the DM-F fail-safe expansion module for SIMOCODE pro V
- Optimum integration of safety-related and functional switching in a system when functions are separate

<table>
<thead>
<tr>
<th>Motor management</th>
<th>Safety technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety function only in the digital module, with no effect on SIMOCODE pro</td>
<td></td>
</tr>
<tr>
<td>Integrated and comprehensive diagnostics of safety functions</td>
<td></td>
</tr>
<tr>
<td>Functional switching by SIMOCODE pro in the fail-safe digital module</td>
<td></td>
</tr>
</tbody>
</table>

SIMOCODE pro V
SIMOCODE pro V PN

Fail-safe digital module DM-F
Motor feeder with local, safety-related shutdown

SIMOCODE pro Safety – DM-F Local

[Diagram of motor feeder with local, safety-related shutdown and component labels such as 'Infeed contactor', 'Functional switching', 'Contactor control', 'SIMOCODE pro Safety', 'E-STOP and E-STOP reset', 'Automation system', and 'PROFIBUS'].

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Page 72  15.11.2013
Motor feeder with safety-related shutdown via fail-safe hardware output

SIMOCODE pro Safety – DM-F Local
Motor feeder with safety-related shutdown via fail-safe CPU and PROFIsafe

SIMOCODE pro Safety – DM-F PROFIsafe

The PROFIsafe telegram is forwarded right down to the DM-F module.
Fail-safe and functional shutdown through innovative combination in the DM-F

SIMOCODE pro Safety – DM-F LOCAL and DM-F PROFIsafe

Outputs of DM-F LOCAL and DM-F PROFIsafe:

- 2 fail-safe enabling circuits, each designed redundantly
- 2 relay outputs for functional switching, can be reliably activated device-internally

- Superimposition of safety-related shutdown with functional switching
- Safety-related shutdown influenced ONLY by DM-F
- Functional switching controlled ONLY by SIMOCODE
Parameter assignment and safety function of the safety solution exclusively in the safety module

SIMOCODE pro Safety – DM-F LOCAL

**Inputs of DM-F LOCAL:**
- 2 sensor circuits, e.g., for Emergency Stop signal
- 1 start input
- 1 cascading input
- 1 feedback circuit

- Safety function up to SIL 3 / PL e with Category 4
- The complete safety function is executed exclusively in the DM-F LOCAL.
- Parameter assignment of the safety function via DIP switch on the DM-F LOCAL.
- Diagnostics information is available in SIMOCODE ES in the form of standard signals.
Extremely easy combining SIMOCODE pro Safety and a fail-safe PLC using PROFIsafe

SIMOCODE pro Safety – DM-F PROFIsafe

Inputs of DM-F PROFIsafe:
• 3 standard inputs
• 1 feedback circuit

• Safety function up to SIL 3 / PL e with Category 4
• The complete safety function is executed exclusively in the DM-F PROFIsafe. PROFIsafe frame is evaluated only in the DM-F.
• Safety-related shutdown is performed from the F-PLC via PROFIsafe.
• DIP switch on the DM-F PROFIsafe can be used to set the PROFIsafe address.
Typical circuit with DM-F LOCAL and shutdown via local Emergency Stop

SIMOCODE pro Safety – DM-F LOCAL
Typical circuit with DM-F PROFIsafe and shutdown via PROFIsafe communication

SIMOCODE pro Safety – DM-F PROFIsafe
Safe and standard I/Os can be assigned to different programs in the F-PLC

SIMOCODE pro Safety – DM-F PROFIsafe

- Access to the same SIMOCODE device from two CPU program parts
- Both for PROFIBUS and PROFINET IO communication
Integration as shared device under PROFINET IO with the DM-F PROFIsafe is possible

SIMOCODE pro Safety – DM-F PROFIsafe

- SIMOCODE standard I/Os and fail-safe outputs can be assigned to different controllers
- Safety application can be executed in a controller independently of process control
- Use of the same network
- Access to the same SIMOCODE devices from two different controllers
Safety without additional effort

SIMOCODE pro Safety – Customer benefits

Integrated

- **Integrated** system solution
- Fail-safe shutdown via **PROFIsafe**
- Descriptive **diagnostics**
- **Logging** of time and cause of errors and DIP setting

Simple

- **Functional and fail-safe** shutdown are pre-combined
- **Little wiring effort** – fewer potential error sources
- **No safety parameter assignment** in SIMOCODE ES

Versatile and flexible

- Flexibly adjustable **safety relay function**
- Inclusion of all SIMOCODE control functions
- Up to **SIL 3 / PL e**

Efficient

- Safety function runs only in the DM-F
- **Saving of DI** on SIMOCODE
- **Saving of F-DO** on the controller
SIMOCODE pro for more motor management

Added value topics – Overview

- Energy efficiency
- Maintenance
- Web server and OPC UA server
- Media redundancy
- SIMOCODE pro Safety
- TIA Portal
Advantages of the TIA Portal now also for SIMOCODE parameter assignment

TIA Portal

- Task- and user-oriented layout
  - Fast access to relevant tools

- Uniform look and feel for all program editors
  - Fast and uniform handling

- Graphical network and device configuration
  - Easy graphical configuring
SIMOCODE ES in the TIA Portal – Intuitive engineering from the start

TIA Portal

Uniform, central, and innovative engineering
- Easy, straightforward configuring in the device view
- Combining of the configuration of an entire plant
- Management of user-created templates for SIMOCODE pro configurations

Graphical parameter assignment and commissioning using integrated graphic editor
- Parameter assignment of the control and protection functions of the control circuit is fast and user-friendly
- Device parameter assignment via drag & drop with graphic editor
- Avoidance of unnecessary plant downtimes through the option of online parameter assignment – including during operation
SIMOCODE ES in the TIA Portal – Complete transparency through comprehensive diagnostic functions

TIA Portal

Easy diagnostics and maintenance

- Easy parameter assignment and diagnostics from a central location via PROFIBUS / PROFINET*) or directly at the control cabinet
- Display of a variety of information in easy-to-read dialogs – for example:
  - Warnings, errors, messages
  - Motor operating hours, motor starts
  - Error log / error history
  - Trends and measurement curves

*) For SIMOCODE ES V12: in progress
# Cross-comparison of functionalities of STEP 7, SIMOCODE ES 2007 and SIMOCODE ES V12

## TIA Portal

<table>
<thead>
<tr>
<th></th>
<th>STEP 7 V12</th>
<th>SIMOCODE ES 2007</th>
<th>SIMOCODE ES V12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic</td>
<td>Standard</td>
<td>Premium</td>
</tr>
<tr>
<td>List parameter assignment</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Parameter assignment via local interface</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Online functions via local interface</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Graphic editor</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Parameter assignment via PROFIBUS/PROFINET</td>
<td>● 1) 2)</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Online functions via PROFIBUS/PROFINET</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integration into STEP 7</td>
<td></td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

1) **Delivery stage 1: V12**
   For all **SIMOCODE pro with PROFIBUS**

2) **Delivery stage 2: V13**
   For all **SIMOCODE pro**

2) Parameter assignment exclusively via startup parameter assignment of SIMATIC S7
SIMOCODE pro technical slides

- Introduction 4
- System 12
- Product 16
- Customer benefits 53
- Added value 57
- Migration 88
- Service, support, and training 92
- Applications and references 97
- Ordering data and logistics 107

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Migrating from pro C to pro S provides clear benefits

Migration

- Additional control functions (star-delta (wye-delta), soft starter)
- Temperature monitoring
- External earth-fault monitoring with 3UL23
- Additional inputs: Control in 24 V DC or 110-240 V AC/DC
- Reduction of basic unit width from 45 mm to 22.5 mm
- Existing configurations from pro C can continue to be used
Easy migration from SIMOCODE ES 2007 to SIMOCODE ES V12

Migration

**Feature / Function**
- **TIA Portal 'Migrate project'** function is used to migrate an existing SIMOCODE ES 2007 project
- Upgrade enables parallel use of SIMOCODE ES 2007 AND SIMOCODE ES V12 (combo license)

**Benefits**
- Existing parameter assignments can be transferred directly to the new software without additional effort.
- The update assures a continued use of SIMOCODE ES 2007.
SIMOCODE pro technical slides

- Introduction 4
- System 12
- Product 16
- Customer benefits 53
- Added value 57
- Migration 89
- Service, support, and training 91
- Applications and references 97
- Ordering data and logistics 107
Competency through comprehensive training

Training

SITRAIN

2-day course "Configuring and Commissioning SIMOCODE pro"

Contents

• SIMOCODE pro devices (current measuring modules, basic unit, expansion modules, fail-safe digital modules, operator panel, accessories)

• Practical exercises for safety technology with SIMOCODE pro Safety using the example of a direct starter with fail-safe shutdown via Emergency Stop, SIL 3, PL e

• SIMOCODE pro function (motor protection and control functions, monitoring and diagnostic functions, logic functions)

• Parameter assignment and diagnostics with SIMOCODE ES

• Communication (connection to SIMATIC S7 via PROFIBUS DP or PROFINET)

• Practical exercises using the reversing starter control function as an example (parameter assignment with SIMOCODE ES, test and diagnostic functions)

For more detailed information, see http://sitrain.automation.siemens.com
Support

**CE promoters**
- Presentation at the Promoters' Conferences, May 2012 and subsequent
- Presentation at CE S in September 2013
- Live meeting with regions in October 2013

**SIVACON power distribution**
- SIVACON Promoters' Conference
- Joint trade fair presence with SIVACON S8
- Inform franchise partners about SIMOCODE pro S

**Electrical wholesale**
- Training for electrical wholesale trade in FY 2013/14

**PCS 7 promotion**
- Participation at Promoters' Conference t.b.d.

**Sector Competence Center / intracompany (Energy, etc.)**
- Presentation to the sector CCs t.b.d.
SIMOCODE pro technical slides

- Introduction 4
- System 12
- Product 16
- Customer benefits 53
- Added value 57
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- Applications and references 96
- Ordering data and logistics 107
Applications and references – SIMOCODE pro with SIVACON S8

Requirements

- Space savings
- Flexibility
- Reliability
- Communication capability

Load feeder

Withdrawable design

Plug-in design
Initialization module allows replacement of an MCC motor feeder with minimum plant downtime

Applications and references – SIMOCODE pro initialization module

- Device parameters and address are automatically stored in the initialization module in the motor control center and downloaded from there (initialized).
- Replacement of a MCC motor feeder is possible without special knowledge of SIMOCODE pro.
- Manual addressing and parameter assignment are no longer required, which simplifies the operation of the switchboard.
Optimum connection between motor application and plant control level via PROFINET IO

Applications and references – Possible motor applications

SIMOCODE pro provides a standardized interface between the application and the PLC.

SIMOCODE pro can be used flexibly with regard to the application. All functions configured in SIMOCODE are also available in case of communication or PLC failure.
Optimum connection between motor application and plant control level via PROFIBUS DP

Applications and references – Possible motor applications

**Automation**
- Operator Station
- Engineering Station
- Maintenance Station
- Power Management

**SIMOCODE**
- S7-400F
- Ethernet
- PROFIBUS DP

**Application**
- Pump
- Fan
- Mixer
- Slide
- Soft starter
- Circuit breaker

SIMOCODE pro provides a standardized interface between the application and the PLC.

SIMOCODE pro can be used flexibly with regard to the application. All functions configured in SIMOCODE are also available in case of communication or PLC failure.
SIMOCODE pro: The intelligent connection between motor application and plant control level

Applications and references – Electric pump (up to 550 kW)

- Operator Station
- Engineering Station
- Maintenance Station
- Power Management

**Automation**

**SIMOCODE**

- S7-400F
- Ethernet
- SIMOCODE pro V basic unit
- Fail-safe digital module
- Temperature module
- Analog module
- Digital module

**Application**

- Pump
- Flow
- Filter
- Tank

- Protection from overload, blocking, phase failure, monitoring of power, power factor, no-load operation, direction of rotation
- Temperature monitoring, e.g., of bearings
- Monitoring, e.g., fill level, underfill, filter, etc.
- Monitoring/status, e.g., overflow, underfill, feedback signals: Open, Closed, On, Off

- Protecting
- Controlling
- Interlocking
- Monitoring
- Communication
SIMOCODE pro: The intelligent connection between motor application and plant control level

Applications and references – Fan (up to 550 kW)

- Operator Station
- Engineering Station
- Maintenance Station
- Power Management

- S7-400F
- Ethernet
- PROFIBUS DP

- SIMOCODE pro V basic unit
- Fail-safe digital module

- Temperature module
- Analog module
- Digital module

- Fan
- Volume flow
- Filter
- Flap
- Heating

- Monitoring: e.g., feedback signals: Open, Closed, On, Off
- Temperature monitoring: e.g., of bearings, supply air, exhaust air
- Monitoring: e.g., pressure, filter, volume flow

- Protection from overload, blocking, phase failure, monitoring of power, V-belt breakage, direction of rotation

- Fail-safe digital module
- Connection of heating to PROFIBUS via SIMOCODE, protecting, switching, monitoring completely in SIMOCODE

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Page 100 15.11.2013
SIMOCODE pro: The intelligent connection between motor application and plant control level

Applications and references – Mixer (up to 550 kW)

- Operator Station
- Engineering Station
- Maintenance Station
- Power Management

Automation

SIMOCODE pro V
basic unit

Fail-safe
digital module

PROFIBUS DP

S7-400F

Ethernet

SIMOCODE pro
basic unit

Temperature
module

Analog
module

Connection of the slide via PROFIBUS by SIMOCODE; interlocks, protection from blocking and monitoring of limit switches and torque switches in SIMOCODE

Connection of the slide via PROFIBUS by SIMOCODE; interlocks, protection from blocking and monitoring of limit switches and torque switches in SIMOCODE

Temperature monitoring, e.g., of bearings, windings, medium

Sensing of, e.g., current position of the slide via analog sensor

- Protection from overload, blocking, phase failure, monitoring of power, no-load operation, viscosity, direction of rotation

- Protecting
- Controlling
- Interlocking
- Monitoring
- Communication

Mixer

Slide

SIMOCODE Application
SIMOCODE pro: The intelligent connection between motor application and plant control level

Applications and references – Control of soft starter and circuit breaker

- Controlling
- Interlocking
- Monitoring
- Communication

Connection of soft starter to PROFIBUS DP via SIMOCODE: controlling via PROFIBUS, detection of errors, status, measurement of current, voltage, power

Connection of the circuit breaker to PROFIBUS DP via SIMOCODE: Switching via PROFIBUS, detection of errors, status, measurement of current, voltage, power
SIMOCODE pro: The intelligent connection between motor application and plant control level

Applications and references – Control of soft starter and circuit breaker

- Controlling
- Interlocking
- Monitoring
- Communication

Connection of soft starter to PROFIBUS DP via SIMOCODE: controlling via PROFIBUS, detection of errors, status, measurement of current, voltage, power

Temperature monitoring, e.g., of bearings

Connection of the Circuit breaker to PROFIBUS DP via SIMOCODE: Switching via PROFIBUS, detection of errors, status, measurement of current, voltage, power
SIMOCODE pro technical slides

- Introduction 4
- System 12
- Product 16
- Customer benefits 53
- Added value 57
- Migration 89
- Service, support, and training 92
- Applications and references 97
- Ordering data and logistics 106
Overview of ordering data for SIMOCODE pro

Basic system

For additional ordering data, see catalog at: [www.siemens.com/simocode](http://www.siemens.com/simocode) or the following PDF: Adobe Acrobat Document
Overview of ordering data for SIMOCODE pro

For additional ordering data, see catalog at: www.siemens.com/simocode