

# SP-COP1

## COMPACT MODULE



### APPLICATIONS

- Machine building industry
- Presses
- Combustion plants
- Elevators and escalators
- Wind turbines
- SIL<sub>CL</sub> 3 (EN 62061-1)
- PL e / Category 4 (EN ISO 13849-1)

### FEATURES

- 20 inputs, 4 outputs on the basic module
- 116 safe inputs and 52 outputs with I/O extension  $\rightarrow$  modules
- Extension with 2 external gateway modules
- Mini USB programming interface
- SD slot for program memory (memory card SP-COP-CARD can be ordered separately)
- Terminals are included in the scope of delivery

### OVERVIEW OF DEVICES | PART NUMBERS

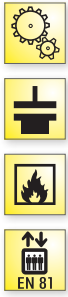
Type	Rated voltage	Terminals	Remarks	Part no.	P.U.
SP-COP1-A	24 V DC	Screw terminals, pluggable		R1.190.1110.0	1
SP-COP1-P-A	24 V DC	Screw terminals, pluggable	PLUS: press, motion, analog	R1.190.1130.0	1
SP-COP1-C	24 V DC	Push-in terminals, pluggable		R1.190.1120.0	1
SP-COP1-P-C	24 V DC	Push-in terminals, pluggable	PLUS: press, motion, analog	R1.190.1140.0	1

### TECHNICAL DATA

Function	Safety control
Function display	24 LED green (in-/outputs) 3 LED green/red/yellow (module status)
<b>Supply circuit</b>	
Operating voltage range	16.8 V DC to 30 V DC
Rated power	3.5 W
Electrical isolation supply circuit - control circuit	No
<b>Safe input circuit I<sub>n</sub></b>	
Quantity/type	20 / digital
Primary voltage range	15 V DC to 30 V DC
Nominal current	2 mA
<b>Safe output circuit Q<sub>n</sub></b>	
Quantity/type	4 / digital
Rated output voltage	24 V DC
Output current per output	4 A
Short-circuit protective device	Yes
<b>Interfaces</b>	
USB Mini interface	Yes
Ethernet interface	No
Industrial Ethernet protocol (basis module)	No
Industrial Ethernet protocol (with gateway module)	ETHERCAT, PROFIBUS DP, CANopen
Program memory	External
<b>General data</b>	
Protection class as per DIN EN 60529 (housing/terminals)	IP20
Air and creepage distances	EN 60664-1
Ambient temperature / storage temperature	-25 °C - +65 °C / -25 °C - +75 °C
Standards	EN 61508, EN 60204, EN 62061, EN ISO 13849-1, EN 81-20/50, EN 692, EN 693, EN/IEC 61511, EN 50156-1
Approvals	TÜV, cULus

# SP-COP2

## COMPACT MODULE WITH ETHERNET



### APPLICATIONS

- Machine building industry
- Presses
- Combustion plants
- Elevators and escalators
- SIL<sub>CL</sub> 3 (EN 62061-1)
- PL e /Kategorie 4 (EN ISO 13849-1)

### MERKMALE

- 16 inputs, 4 outputs, 4 configurable I/O on basic module
- 112 safe inputs and 56 outputs with I/O extension module
- Extension with 2 external gateway modules
- Industrial Ethernet protocols on basic module
- Ethernet interface for programming
- Mini USB programming interface
- SD-Slot für Programmspeicher (Speicherkarte SP-COP-CARD separat bestellbar)
- Terminals are included in the scope of delivery

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### OVERVIEW OF DEVICES | PART NUMBERS

Type	Terminals	Remarks	Part no.	P.U.
SP-COP2-EN-A	Screw terminals, pluggable	Ethernet	R1.190.1210.0	1
SP-COP2-EN-P-A	Screw terminals, pluggable	Ethernet, PLUS: press, motion, analog	R1.190.1230.0	1
SP-COP2-EN-C	Push-in terminals, pluggable	Ethernet	R1.190.1220.0	1
SP-COP2-EN-P-C	Push-in terminals, pluggable	Ethernet, PLUS: press, motion, analog	R1.190.1240.0	1
SP-COP2-ENI-A	Screw terminals, pluggable	Industrial Ethernet	R1.190.1310.0	1
SP-COP2-ENI-P-A	Screw terminals, pluggable	Industrial Ethernet, PLUS: press, motion, analog	R1.190.1330.0	1
SP-COP2-ENI-C	Push-in terminals, pluggable	Industrial Ethernet	R1.190.1320.0	1
SP-COP2-ENI-P-C	Push-in terminals, pluggable	Industrial Ethernet, PLUS: press, motion, analog	R1.190.1340.0	1

### TECHNICAL DATA

<b>Function</b>	Safety control	
Function display	24 LED green (in-/outputs) 4 LED green/red/yellow (module status)	
<b>Supply circuit</b>		
Operating voltage range	16.8 V DC to 30 V DC	
Rated power	3.5 W	
Electrical isolation supply circuit - control circuit	No	
<b>Safe input circuit I<sub>n</sub></b>	<b>SP-COP2-EN</b>	<b>SP-COP2-ENI</b>
Quantity/type	20 (16) / digital	20 (16) / digital
Primary voltage range	15 V DC to 30 V DC	15 V DC to 30 V DC
Nominal current	2 mA	2 mA
<b>Safe output circuit Q<sub>n</sub></b>		
Quantity/type	4 (8) / digital	4 (8) / digital
Rated output voltage	24 V DC	24 V DC
Output current per output	4 A	4 A
Short-circuit protective device	Yes	Yes
<b>Interfaces</b>		
USB Mini interface	Yes	Yes
Ethernet interface	Yes	Yes
Industrial Ethernet protocol (basis module)	No	Modbus TCP, Profinet, Ethernet IP
Industrial Ethernet protocol (with gateway module)	ETHERCAT, PROFIBUS DP, CANopen	ETHERCAT, PROFIBUS DP, CANopen
Program memory	External	External
<b>General data</b>		
Protection class as per DIN EN 60529 (housing/terminals)	IP20	
Air and creepage distances	EN 60664-1	
Ambient temperature / storage temperature	-25 °C - +65 °C / -25 °C - +75 °C	
Standards	EN 61508, EN 60204, EN 62061, EN ISO 13849-1, EN 81-20/50, EN 692, EN 693, EN/IEC 61511, EN 50156-1	
Approvals	TÜV, cULus	

# SP-SDIO

## INPUT-/ OUTPUT MODULE



### APPLICATIONS

- Machine building industry
- Presses
- Combustion plants
- Elevator systems
- SIL<sub>CL</sub> 3 (EN 62061-1)
- PL e / Category 4 (EN ISO 13849-1)

### FEATURES

- 8 safe inputs
- 4 safe outputs (with/without output test-pulses)
- 2 outputs (e.g., test signals)

### OVERVIEW OF DEVICES | PART NUMBERS

Type	Rated voltage	Terminals	Remarks	Part no.	P.U.
SP-SDIO84-P1-K-A	24 V DC	Screw terminals, pluggable	with/without output test-pulses	R1.190.0030.0	1
SP-SDIO84-P1-K-C	24 V DC	Push-in terminals, pluggable	with/without output test-pulses	R1.190.0040.0	1

#### TECHNICAL DATA

Function display	13 LEDs, green/red
<b>Power supply circuit</b>	
Operating voltage range	16.8 V DC to 30 V DC
Rated consumption	1.8 W
Electrical isolation power supply circuit - control circuit	no
<b>Safe input circuit I1 – I8</b>	
Quantity / type	8 / digital
Input voltage range	15 V DC to 30 V DC
Rated current	3 mA
<b>Safe output circuits Q1 – Q4</b>	
Quantity / type	4 / digital
Output voltage	24 V DC
Output current I <sub>n</sub> per exit	4 A
<b>Output circuits X1, X2</b>	
Quantity / type	2 / digital
Output voltage	24 V DC
Output current I <sub>n</sub> per exit	0.5 A
<b>General data</b>	
Protection degree according to DIN 60529 (housing / terminals)	IP40 / IP20
Creepage distances and clearances	EN 60664-1
Ambient temperature / storage temperature	-25°C – +65°C / -25°C – +75°C
Standards	EN 61508, EN 61511, EN 62061, EN ISO 13849-1, EN 50156-1
Approvals	TÜV, cULus

# SP-SDI

## INPUT MODULE



### APPLICATIONS

- Machine building industry
- Presses
- Combustion plants
- Elevator systems
- SIL<sub>CL</sub> 3 (EN 62061-1)
- PL e / Category 4 (EN ISO 13849-1)

### FEATURES

- 8 safe inputs
- 8 outputs (e.g., test signals)

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### OVERVIEW OF DEVICES | PART NUMBERS

Type	Rated voltage	Terminals	Part no.	P.U.
SP-SDI8-P1-K-A	24 V DC	Screw terminals, pluggable	R1.190.0050.0	1
SP-SDI8-P1-K-C	24 V DC	Push-in terminals, pluggable	R1.190.0060.0	1

TECHNICAL DATA	
Function display	13 LEDs, green/red
<b>Power supply circuit</b>	
Operating voltage range	16.8 V DC to 30 V DC
Rated consumption	1.8 W
Electrical isolation power supply circuit - control circuit	no
<b>Safe input circuit I1 – I8</b>	
Quantity / type	8 / digital
Input voltage range	15 V DC to 30 V DC
Rated current	3 mA
<b>Output circuits X1, X2</b>	
Quantity / type	2 / digital
Output voltage	24 V DC
Output current I <sub>n</sub> per exit	0.5 A
<b>General data</b>	
Protection degree according to DIN 60529 (housing / terminals)	IP40 / IP20
Creepage distances and clearances	EN 60664-1
Ambient temperature / storage temperature	-25°C – +65°C / -25°C – +75°C
Standards	EN 61508, EN 61511, EN 62061, EN ISO 13849-1, EN 50156-1
Approvals	TÜV, cULus



#### NOTE:

Safe relay contacts are expanded using the series SNE contact expansion relay (from Page 68). Types **SNE 4024K** and **SNE 4012K** in particular are ideal for contact expansion.



# SP-SA

## ANALOG INPUT MODULE\*)



### APPLICATIONS

- Machine building industry
- Process industry
- Combustion plants
- up to SIL<sub>CL</sub> 3 (EN 62061-1)
- up to PL e/Category 4 (EN ISO 13849-1)

### FEATURES

- 4 safe analog inputs
- Galvanic isolation
- Limits monitoring
- Mathematical functions
- Scaling

### OVERVIEW OF DEVICES | PART NUMBERS

Type	Rated voltage	Terminals	Remarks	Part no.	P.U.
SP-SAR4-A	DC 24 V	Screw terminals, pluggable	4 safe inputs RTD	R1.190.1610.0	1
SP-SAR4-C	DC 24 V	Push-in terminals, pluggable	4 safe inputs RTD	R1.190.1620.0	1
SP-SAC4-A	DC 24 V	Screw terminals, pluggable	4 safe inputs 0-20 mA	R1.190.1630.0	1
SP-SAC4-C	DC 24 V	Push-in terminals, pluggable	4 safe inputs 0-20 mA	R1.190.1640.0	1
SP-SACR22-A	DC 24 V	Screw terminals, pluggable	2 safe inputs RTD, 2 safe inputs 0-20 mA	R1.190.1650.0	1
SP-SACR22-C	DC 24 V	Push-in terminals, pluggable	2 safe inputs RTD, 2 safe inputs 0-20 mA	R1.190.1660.0	1

### TECHNICAL DATA

Function display	6 LED green/red		
<b>Power supply circuit</b>			
Operating voltage range	16,8 V DC to 30 V DC		
Rated consumption	1,5 W		
Electrical isolation	yes (input circuit - supply circuit)		
<b>Safe input circuit I<sub>n</sub></b>	<b>SP-SAR4</b>	<b>SP-SAC4</b>	<b>SP-SACR22</b>
Quantity / type	4 / analog	4 / analog	4 / analog
Input type	4 x temperature-dependent resistor (RTD)	4 x power interface	2 x temperature-dependent resistor (RTD) 2 x power interface
Sensor type	PT100, PT200, PT500, PT1000, NI100, NI1000	0 - 20 mA, 4 - 20 mA	PT100, PT200, PT500, PT1000, NI100, NI1000 0 - 20 mA, 4 - 20 mA
Resolution	16 Bit	16 Bit	16 Bit
<b>General data</b>			
Protection degree according to DIN 60529	IP20		
Creepage distances and clearances	EN 60664-1		
Ambient temperature / storage temperature	-25 °C - +65 °C / -25 °C - +70 °C		
Standards	EN 61508, EN 61511, EN 62061, EN ISO 13849-1, EN 50156-1		
Approvals	TÜV, UL (pending)		

# SP-DIO

## STANDARD I/O-MODUL



### APPLICATIONS

- Machine building
- Presses
- Firing systems
- Elevator systems

### MERKMALE

- 4 standard inputs
- 4 standard outputs
- 4 configurable standard in-/outputs

### OVERVIEW OF DEVICES | PART NUMBERS

Type	Rated voltage	Terminals	Part no.	P.U.
SP-DIO84-K-A	24 V DC	Screw terminal, pluggable	R1.190.1050.0	1
SP-DIO84-K-C	24 V DC	Push-in terminal, pluggable	R1.190.1060.0	1

FUNCTION DISPLAY	
Function display	13 LED, green/red
<b>Function display</b>	
Operating voltage range $U_B$	16.8 V DC to 30 V DC
Rated power	0,5 W
Electrical isolation supply circuit - control circuit	no
<b>Standard input circuits <math>I_n, IY_n</math></b>	
Quantity / type	4 (8) / digital
Input voltage range	15 V DC to 30 V DC
Nominal current	3 mA
<b>Standard output circuits <math>Q_n, IY_n</math></b>	
Quantity / type	4 (8) / digital
Output voltage	24 V DC
Output current $I_n$ per output	0.5 A
Short-circuit protective device	yes
<b>General data</b>	
Protection class as per DIN EN 60529 (housing/terminals)	IP40 / IP20
Air and creepage distances	EN 60664-1
Ambient temperature / storage temperature	-25°C - +65°C / -40°C - +70°C
Standards	EN 60204, EN 50156-1
Approvals	cULus

# GATEWAY

With the samos®PRO gateways, system information can be transferred between the samos®PRO safe control and an industrial control, a visualization system or a PC.



## APPLICATION EXAMPLES:

- Direct HMI connection
- Remote diagnosis and programming
- Read and write 50 byte
- Input and output states
- Configuration data
- Process data from the PLC
- Fault data (e.g. fault data of the connected sensor technology)



## SP-CANOPEN

### FEATURES

- Fieldbus protocol CANopen
- Bidirectional communication with PLC
- Transfer rate up to 1 MBit/s
- Transfer of 50 bytes of data
- Simple configuration with samos®PLAN 6
- Extended diagnosis and future compatibility (R1.190.0210.1)
- Note: for backward compatibility and existing projects please use R1.190.0210.0



## SP-PROFIBUS-DP

### FEATURES

- Fieldbus protocol PROFIBUS-DP
- Bidirectional communication with PLC
- Transfer rate 12 MBaud
- Transfer of 50 bytes of data
- Simple configuration with samos®PLAN 6
- Extended diagnosis and future compatibility (R1.190.0190.1)
- Note: for backward compatibility and existing projects please use R1.190.0210.0



## SP-EN-ETC

### FEATURES

- EtherCAT industrial Ethernet protocol
- Bidirectional communication
- Transfer of 50 bytes of data
- Simple configuration with samos® PLAN 6

### OVERVIEW OF DEVICES | PART NUMBERS

Type	Rated voltage	Remark	Part no.	P.U.
SP-CANopen	24 V DC	CANopen with extended diagnosis (with SP-COPx starting version D-xx)	R1.190.0210.1	1
SP-PROFIBUS-DP	24 V DC	PROFIBUS DP with extended diagnosis (with SP-COPx starting version D-xx)	R1.190.0190.1	1
SP-EN-ETC	24 V DC	ETHERCAT	R1.190.0160.0	1

# STARTER SET & ACCESSORIES



## SAMOS®PRO COMPACT STARTER SET

- A safe way to get started
- Contains all required components
- With programming tool samos®PLAN 6

SP-COP-STARTER-SET:

Set including SP-COP2-EN-A, SP-COP-CARD1, SP-PLAN6, SP-CABLE-USB1, SP-CABLE-ETH1



SP-COP-CARD1



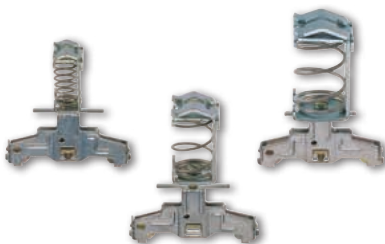
SP-CABLE-USB1

SP-CABLE-ETH1

## SAMOS®PRO ACCESSORIES

Contents of the starter set

- SP-COP-CARD1: Memory-card for SP-COP
- SP-CABLE-USB1: USB cable for SP-COP, 1.8 m
- SP-CABLE-ETH1: Ethernet cable for SP-COP, 2 m
- Programming software samos®PLAN 6



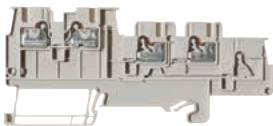
# STARTER SET & ACCESSORIES



**HMI-ECO**

## FURTHER SAMOS<sup>®</sup>PRO ACCESSORIES

- For HMI-ECO touch panels and hmi plan visualization software, see Industrial Communication brochure (0801.0)



**WTP 1,5 I/O -3**

- Three-wire initiator/actuator terminal with push-in connection for mounting on MR 35



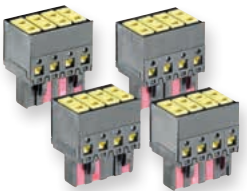
**SHIELDED CABLE TERMINALS  
FASIS WST .../T35**

- For mounting on TS 35 mounting rail



**SAFETY  
SCHRAUBKL. SET**

- Screw terminal set with 4 different codings for 5 devices



**SAFETY  
PUSH IN SET**

- Push-in terminal set with 4 different codings for 5 devices

## OVERVIEW OF DEVICES | PART NUMBERS

Type	Description	Part no.	P.U.
SP-COP-CARD1	Memory-card for SP-COP	R1.190.1000.0	1
SP-CABLE-USB1	USB cable for SP-COP, 1.8 m	R1.190.1010.0	1
SP-CABLE-ETH1	Ethernet cable for SP-COP, 2 m	R1.190.1020.0	1
SP-COP-STARTER-SET	Content: SP-COP2-EN-A, SP-COP-CARD1, SP-PLAN6, SP-CABLE-USB1, SP-CABLE-ETH1	R1.190.1100.0	1
HMI-LICENSE-SINGLE	Single-user license for HMIs, programming software for HMIs	ZW.000.0170.0	1
HMI-ECO-043	HMI Eco touch panel, 4.3" color, TFT, 480x272 pixels	83.050.0000.0	1
HMI-ECO-070	HMI Eco touch panel, 7" color widescreen, TFT, 800x480 pixels	83.050.0001.0	1
HMI-ECO-100	HMI Eco touch panel, 10" color, TFT, 1024x600 pixels	83.050.0002.0	1
SP-COVER	SD card slot cover for SP-COP modules	R1.190.1040.0	1
SAFETY SCHRAUBKL.SET	Screw terminal set with 4 different codings for 5 devices	99.208.9999.9	1
SAFETY PUSH IN SET	Push-in terminal set with 4 different codings for 5 devices	99.209.9999.9	1
WTP 1,5 I/O -3	fasis - multi-tier block with diodes	56.202.8055.0	100
APFN 2,5 E/35	End plate	07.312.7355.0	10
WST 8 / TS 35	For mounting on TS 35 mounting rail	Z2.803.6010.0	10
WST 13,5 / TS 35	For mounting on TS 35 mounting rail	Z2.803.6010.0	10
WST 20 / TS 35	For mounting on TS 35 mounting rail	Z2.803.6210.0	10

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