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# **SAFETY CONTROL SYSTEM**

**SC-1000**

**SC-I/O**

## AUTOMATION AND CONTROL SOLUTIONS

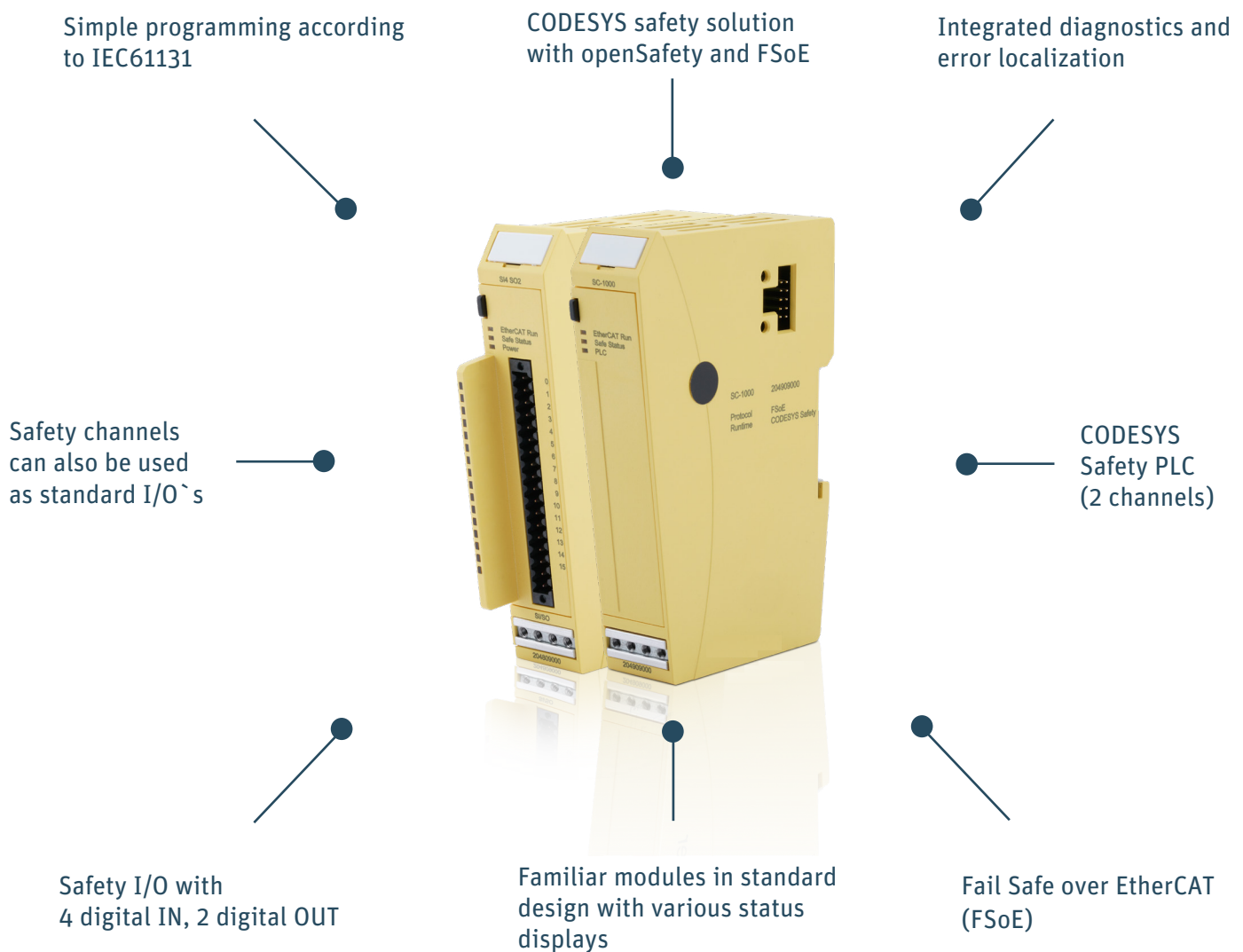
- Certified in compliance with the CODESYS standard
- Can be combined with standard products
- Fail Safe over EtherCAT (FSoE)
- Safety software package merged into CODESYS
- Online monitoring of secure and insecure data
- SIL3 according to IEC 61508
- PLe according to DIN EN ISO 13849

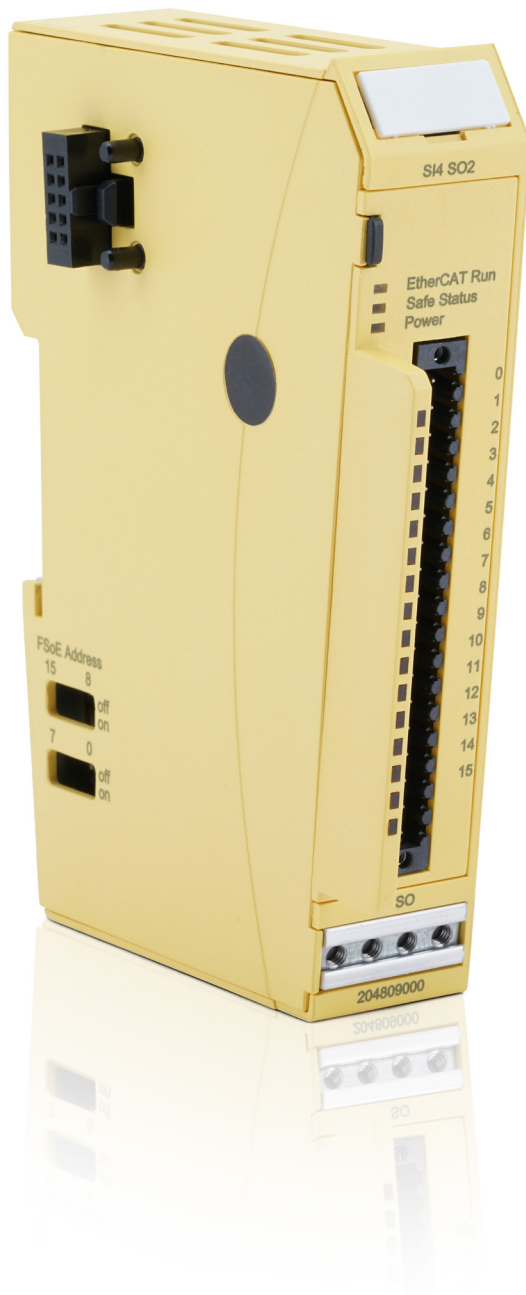
Integrated and CODESYS programmable safety solution.



## Safety technology under control

The innovative and integrated safety solution comprises a freely programmable CODESYS Safety PLC and a Safety I/O module in accordance with the requirements of the safety standards IEC 61508 SIL 3 and DIN ISO 13849-1 PL<sub>e</sub>. The core of the Safety PLC consists of two microprocessors that implement the safety functions and communicate with each other in order to exchange process data and monitor each other. A third microprocessor manages the external communication. The Safety I/O module has 4 digital inputs and 2 digital outputs and allows the connection of common safety devices. The outputs of the module ensure safe connection of actuators such as contactors, signal lamps or drives. As add-on standard modules with integrated bus system, the devices can be easily installed and combined with other control components.





## Best possible control

through exchangeability of information for diagnosis or status as well as interconnection of signals between all levels

## Optimally secured

with the help of additional functions for safeguarding the safety function, e.g. change tracking, safe signal flow, safe versioning, separation of safe operation

## Safety technology under control

with certified PLCopen function blocks in Basic and Extended Level as well as certified hardware

## Maximum system solution

through modular implementation and easy interaction with all Berghof standard products

## Unsurpassed flexibility

thanks to modular expandability and any division within the plant control system

## Excellent plant integration

due to simple connection of any FSoE slaves (e.g. safety I/O modules, drive controllers)

## No limits

due to limitation of the number of usable safety modules only by the device memory

## Ideal operation

by integrating the safety software into the CODESYS standard and graphically interconnecting all elements

## Intuitive project planning and programming

allows the user to feel no boundaries between safety and non-safety components



# SC-1000, SC-I/O

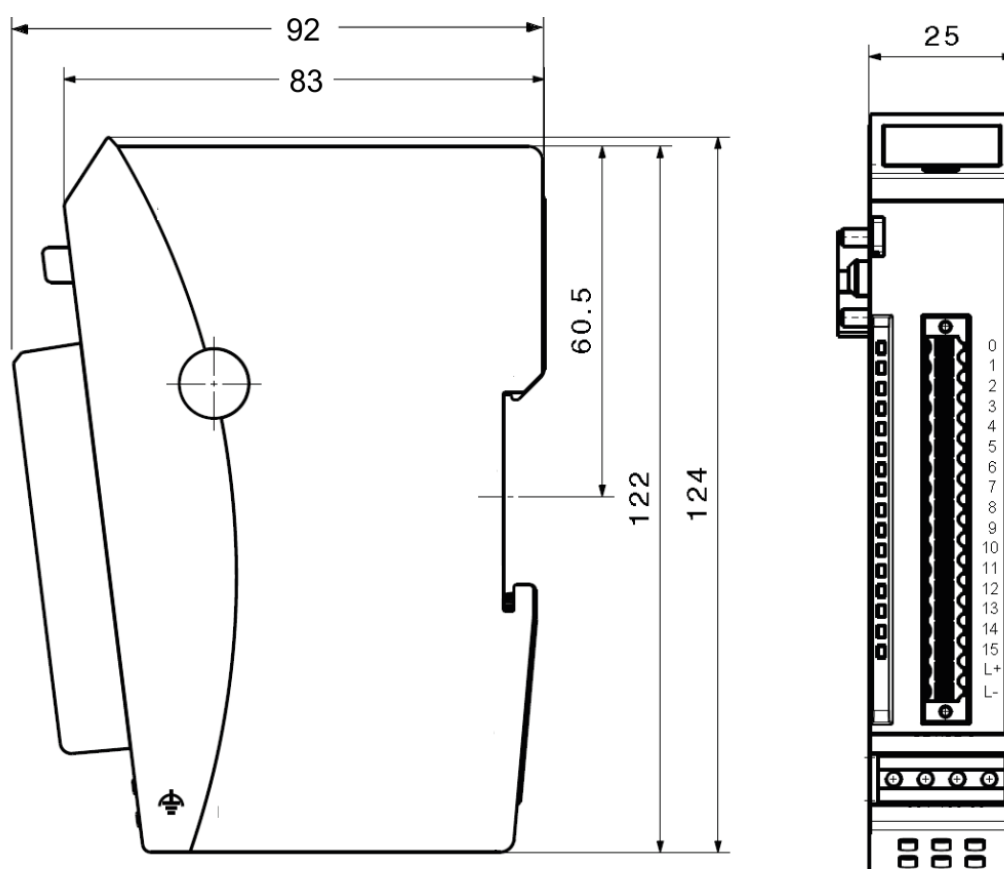
## INFORMATION TECHNICAL DATA



SC-1000, SC-I/O		
Description	SC-1000	SC-I/O
Order number	S-01060101-0000	S-01060201-0000
Dimensions (WxHxD) [mm]	25 x 124 x 83	25 x 124 x 92
Weight	approx. 150 g	
Mounting	Rail mounting NS 35/7,5 EN 50022	
Safety standard	IEC 61508 SIL 3 and DIN EN ISO 13849-1 PL e	
Development environment	CODESYS V3 (IEC61131-3) with Safety Plug in	
Communication interfaces	1x EtherCAT, LVDS	
Safety protocol	Safety over EtherCAT (FSOE)	
Digital I/Os	-	4x failsafe digital In 2x failsafe digital Out
Realizable safety functions	4x emergency stop 4x contact detector 2x light grids 2x single-hand operation 2x independent	
Supply voltage	5 V DC via LVDS connection comes from head module (Bus Coupler or PLC in accordance with EN 61131-2, Supply with 24 V DC, min. -15% / +20% SELV/PELV)	
Current consumption	Typ. 0,3 A	Typ. 0,3 A max. 2x 2A depending on load of the I/O
Operating conditions transport / storage	Ambient temperature: Operating: 0 °C to 55 °C / Transport -25 °C to +70 °C Relative humidity: 5...95%, non-condensing	
EMC, Protection type		
Immunity of interference	Installation in zone B according to 61000-6-2, in accordance with EN61131-2, installation on earthed top-hat rail in earthed switch cabinet. Install the earthing according to the operating conditions.	Zone B according to EN 61131-2:2007, Installation on earthed rail in earthed switch cabinet
Overvoltage category	Category II according to IEC 60664-1, in accordance with EN 61131-2	Categories II and II of Annex I EN 61131-2:2007
Protection type	IP20	
Vibration	5...8,4 Hz: ±3,5 mm Amplitude, 8,4...150 Hz: 10 m/s² (1g), nach IEC 60068-2-6, Prüfung Fc	
Schock resistance	150 m/s² (15g), 11 ms half-sine, after IEC 60068-2-27	

# SC-1000, SC-I/O

## INFORMATION DIMENSIONS



Dimensions SC-System



**SAFETY SERVICES**  
RISK ASSESSMENT  
SAFETY CONCEPTS  
DOCUMENTATION  
VERIFICATION  
SAFETY TRAININGS

As a machine manufacturer as well as a machine operator, you are faced with the responsibility to bring plants and machines to such a safety level as the latest state of the art allows.

At national and international level, standards and directives stipulate the point at which you, as a machine manufacturer or installer of a system, have fulfilled your duty of care.

Has developed an innovative and integrated safety solution to minimize the risk to people and the environment from technical equipment.

This comprises a freely programmable CODESYS Safety PLC and a Safety I/O Module (see catalog page 120) in accordance with the requirements of the safety standard norms according to IEC 61508 SIL 3 and DIN EN ISO 13849-1 PL<sub>e</sub>.

It is easy to implement the safety functions certified according to PLCopen:

- Emergency stop switch (EN 418)
- Two-handed operation (EN 574)
- Enabling switch, operating mode selector switch (IEC 60204)
- Safety door (EN 953/1088)
- Light barrier (IEC 61496 / 62046)
- Muting sensors (IEC 61496 / 62046)
- Actuator/valve with safe state or safe function (IEC 60204)
- Relay with feedback contact (IEC 60204)
- Unsafe switched output with monitoring (IEC 60204)

Do you need support in implementing the standards and guidelines correctly, understanding them and ensuring that they are effectively internalized by your employees?

Offers you a fully comprehensive safety service package and gets you to a safe machine and perfectly trained personnel in 3 steps.



## 3 STEPS TO A SAFE MACHINE

**1. Risk Assessment**

**2. Safety Concepts**

**3. Verification  
Documentation**

**Trainings**

**Risk Reduction**

## 3 STEPS TO A SAFE MACHINE

### 1. Risk Assessment



In the first step, potential hazards of your machine are analyzed and examined together with you for possible risks, taking into account the essential standards and guidelines.

Possible hazards are identified along the entire life cycle of the machine and in the various operating modes and evaluated with regard to their probability of occurrence and extent of damage.

### 2. Safety Concepts



In the second step, specialists develop a customized security concept for you.

In cooperation with you, all necessary measures are defined and detailed solution proposals for the implementation of safety into your machine.

Once all measures have been defined, supports you in commissioning the necessary safety functions of your machine.

### 3. Verification Documentation



In the third and final step, supports you in verifying the previously implemented safety functions according to DIN EN ISO 13849-1.

To round it all off, standard-compliant and easy-to-understand operating and assembly instructions are created for you.

### Trainings



Companies often lack the know-how of current safety standards and norms as well as the basic knowledge of functional safety.

In the course of safety training courses tailored to your individual needs, the know-how of your employees is sustainably built up and kept up to date.