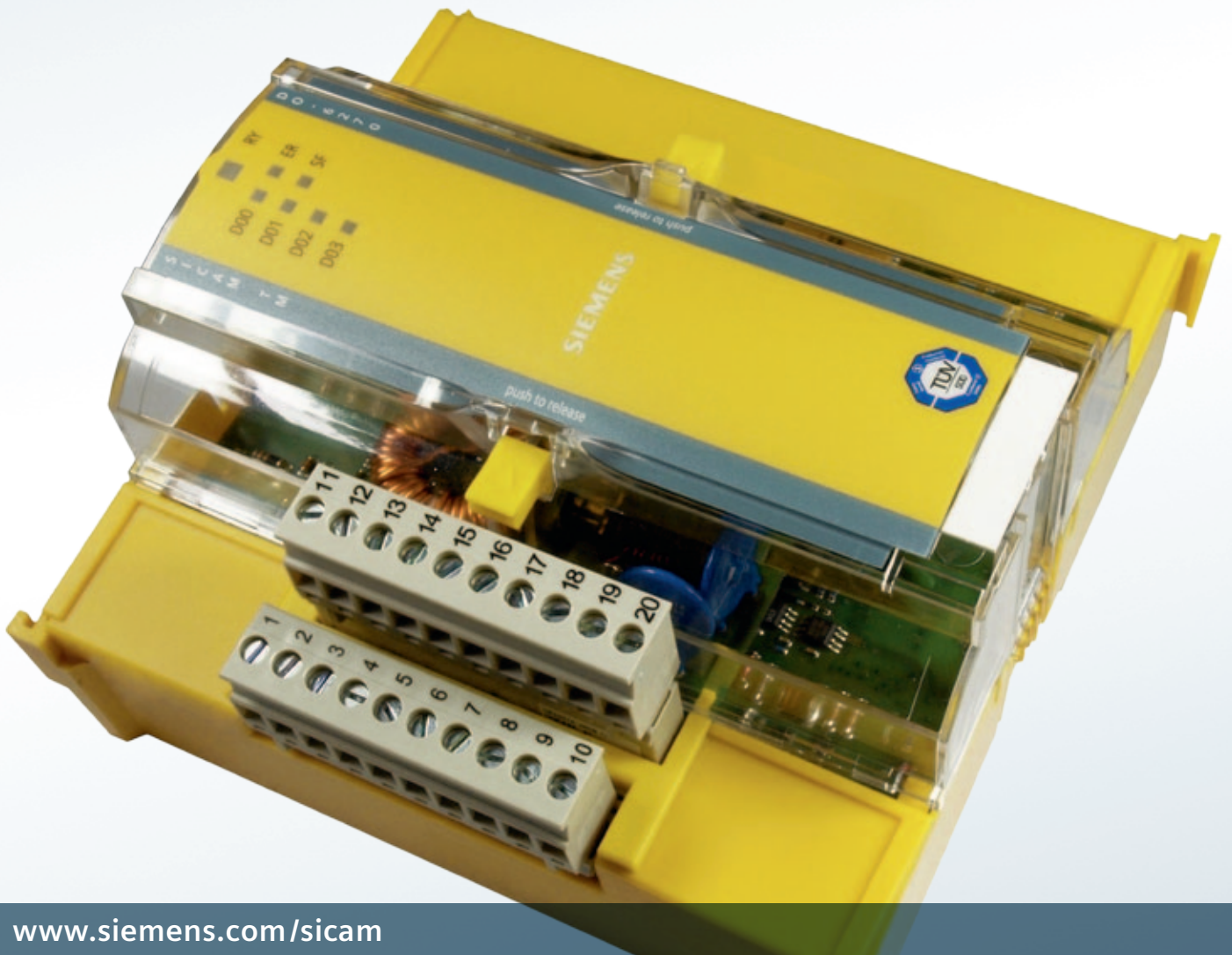


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# SICAM Safety

Full functionality for safety-critical applications

Answers for infrastructure and cities.

# More safety for your automation system

Whether for hydropower plants or in the oil and gas sector, the energy industry relies on automation for energy distribution. But many plant components are safety-critical. So it is good when the necessary safety functions are already incorporated right in the automation solution.



## Protect people and the environment

The goal of safety technology is to minimize the dangers of plant operation for people and environment without restricting production more than necessary.

The safety requirements of the Machinery Directive 2006/42/EC are found in the following standards:

- **EN ISO 13849 – Safety of machinery**  
Safety-related parts of control systems
- **IEC 61508 / 62061 – Safety of machinery**  
Functional safety of safety-related electronic control systems

## Choose carefully

If you are planning to automate certain applications in your plant, you should always keep an eye on safety requirements when choosing the components. The most important criterion is a certified safety integrity level (SIL). SICAM safety components comply with all specifications.

If a risk assessment has shown that a safe state can be attained in the relevant part of the plant through disconnection from the supply, SICAM systems with safety components are the right choice.



# One system for every application

## Use SICAM Safety for your specific needs

SICAM Safety is primarily suitable for the automation of hydropower plants. The modules protect turbines and generators from mechanical overload by reliably detecting:

- impermissible operating states,
- imbalance of the shaft due to bearing damage,
- rise in temperature due to an interwinding fault in the generator, or
- a guide vane fracture in a Francis turbine.

SICAM Safety is also the right solution in the oil and gas segment. You can count on SICAM quality in safety-related automation functions in pipelines.

## Profit from consistency

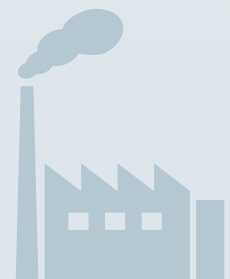
SICAM Safety lets you simply and conveniently integrate safety functions in your plant. In addition to automation functions, your SICAM platform thus also fulfills the necessary safety requirements. One system, more functionality, standard engineering – for safety with efficiency.

### ● Expand your SICAM platform

The SICAM Safety application upgrades your existing SICAM hardware with reliable open and closed loop control functions. The SICAM Safety input/output modules are designed as terminal modules, allowing them to be combined flexibly with SICAM standard modules.

### ● Expand SICAM TOOLBOX II

Plan and implement safety-related functions with the CAEx safety toolset – conveniently and simply in a single engineering tool.



# Two-channel solution for maximum protection

Risk assessment and identifying the safety class are the two steps that need to be taken before integrating safety systems. Whatever is the outcome of the analyses – you will find the right safety components for every SICAM automation solution.

## Highest possible safety levels

EN ISO 13849

Performance Level PL d / Category 3

IEC 61508 / 62061

Safety Integrity Level SIL 2 / High Demand



## Rely on a two-channel solution

When you use SICAM Safety, process information from the sensor via the control system to the actuators is processed on a two-channel basis. To this end, the internal design of all safety modules features two-channel technology. Two integrated processors process the firmware in parallel and detect faults. The crucial advantage is that they also monitor each other. If a malfunction occurs, the modules switch over reliably to a safe state or remain in this state.

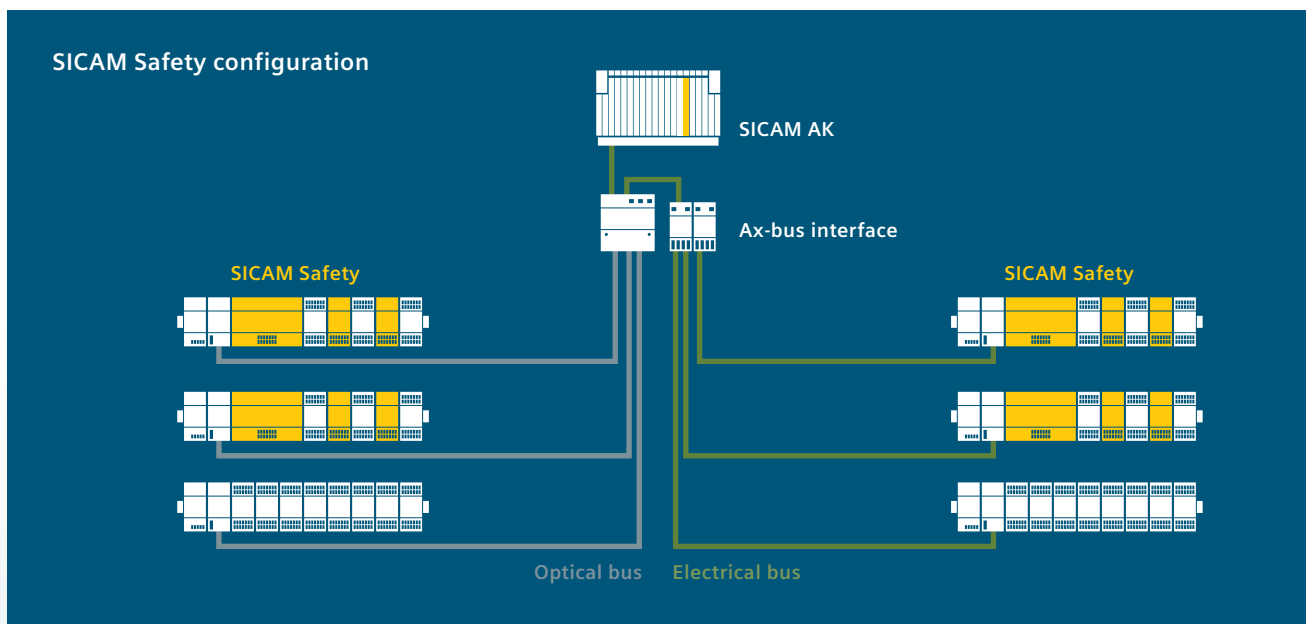
***Guaranteed reaction time:  
100 ms from occurrence of a  
criterion to triggering***

## Count on proven solutions

- Standard and safety-related automation functions are separated.
- The PROFIsafe protocol is used for communication between a safety-related control unit and the safety-related peripheral equipment.
- Engineering in SICAM TOOLBOX II: You use OPM II to process the safety parameters; then you finally verify and validate safety controls and parameters with the CAEx safety toolset.



# Multiple options for your plant configuration



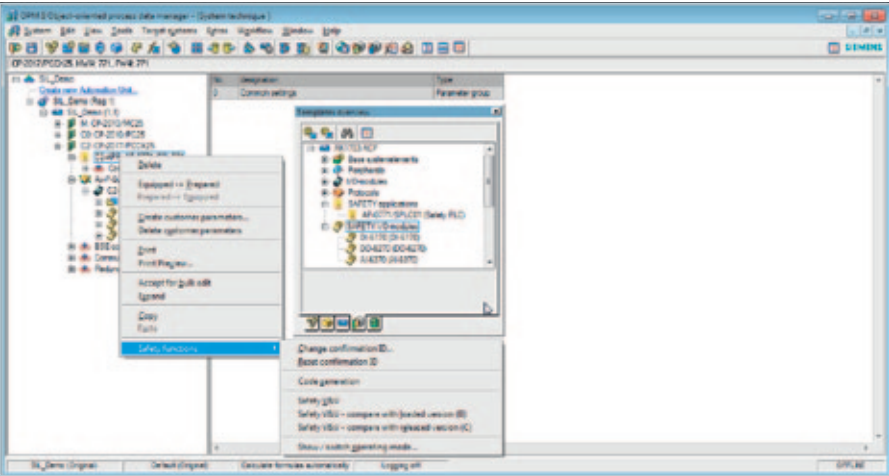
## Safety application on existing hardware

- Safety and standard applications run simultaneously.
- Several CP-2017 processing and communication elements can be installed in an automation unit.
- Several distributed peripheral elements can be connected to SICAM AK.

## Use of SICAM Safety input/output modules

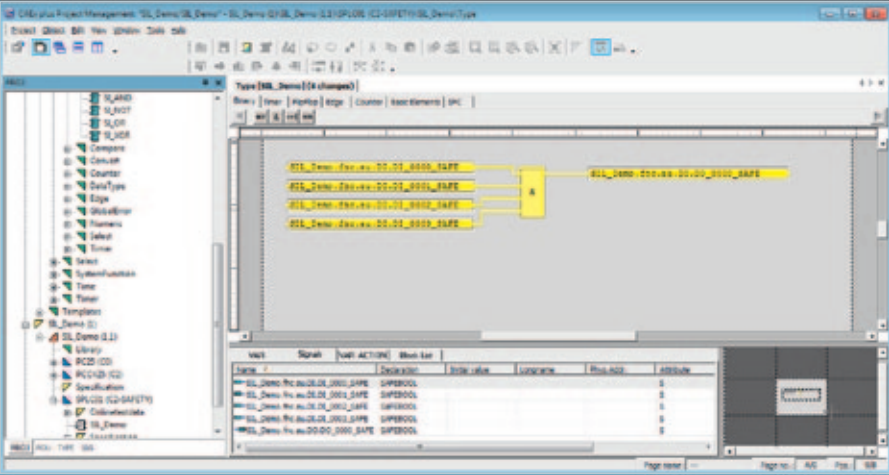
- Binary input and output for 24 VDC
- Analog input for 4 to 20 mA
- Thanks to the terminal module design, a mix of standard and safety modules is possible – also for retrofitting.
- The connection can be made via several lines – with a choice of optical and / or electrical.

# Less effort for your engineering



### Step 1

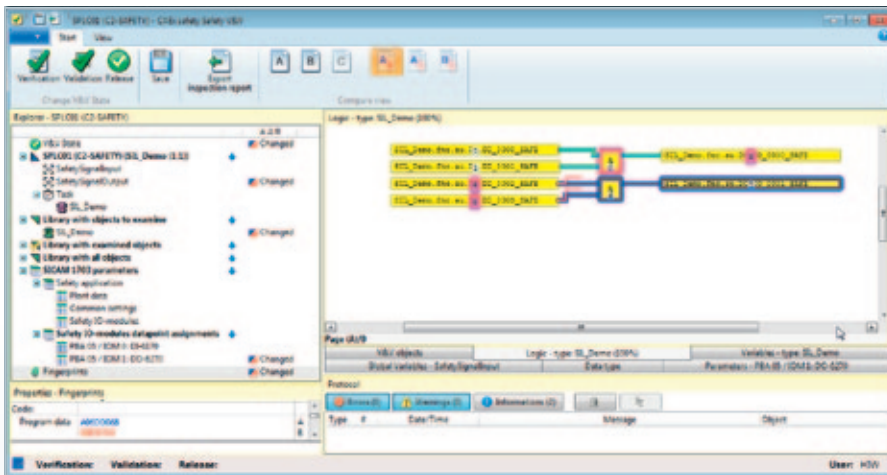
- Purchase license for the “CAEx safety” toolset.
- Install CAEx safety.
- Use all safety functions and applications.



### Step 2

- Set up Safety user programs in SICAM TOOLBOX II – no additional planning software required.
- Implement functions in the plant.





### Step 3

- TÜV approval of the safety technology
- Significant time saving thanks to automatic documentation and marking of changes in the engineering system



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