

SIEMENS



Certified
for railway
applications



Safety technology for automation

SICAM Safety

Full functionality for safety-critical applications

www.siemens.com/sicam

More safety for your automation system

Whether in hydropower plants, in the oil and gas industry or on the railways – a large number of system components are safety-critical. It's good when the automation solution already embodies the necessary safety functions.



Protect people and the environment

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

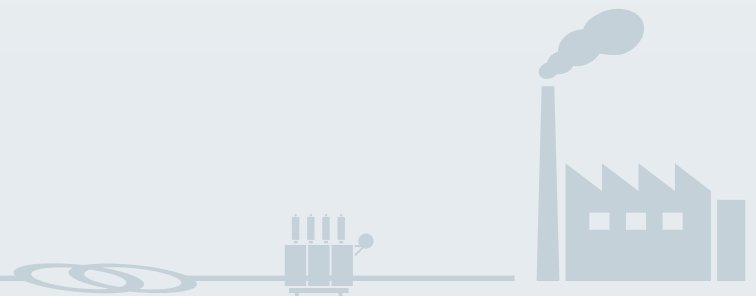
The safety requirements of the Machinery Directive 2006/42/EC are found in the following standards:

- **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

Hydropower plants

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.

Pipeline operation

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.

Railway applications

Specific safety standards – EN 50126, EN 50128 and EN 50129 – apply for railway applications. Our automation devices SICAM AK and SICAM TM are certified in accordance with these standards.

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.

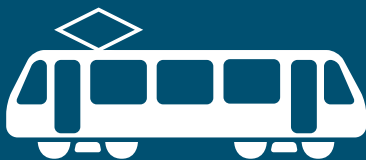
Highest possible safety levels

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.

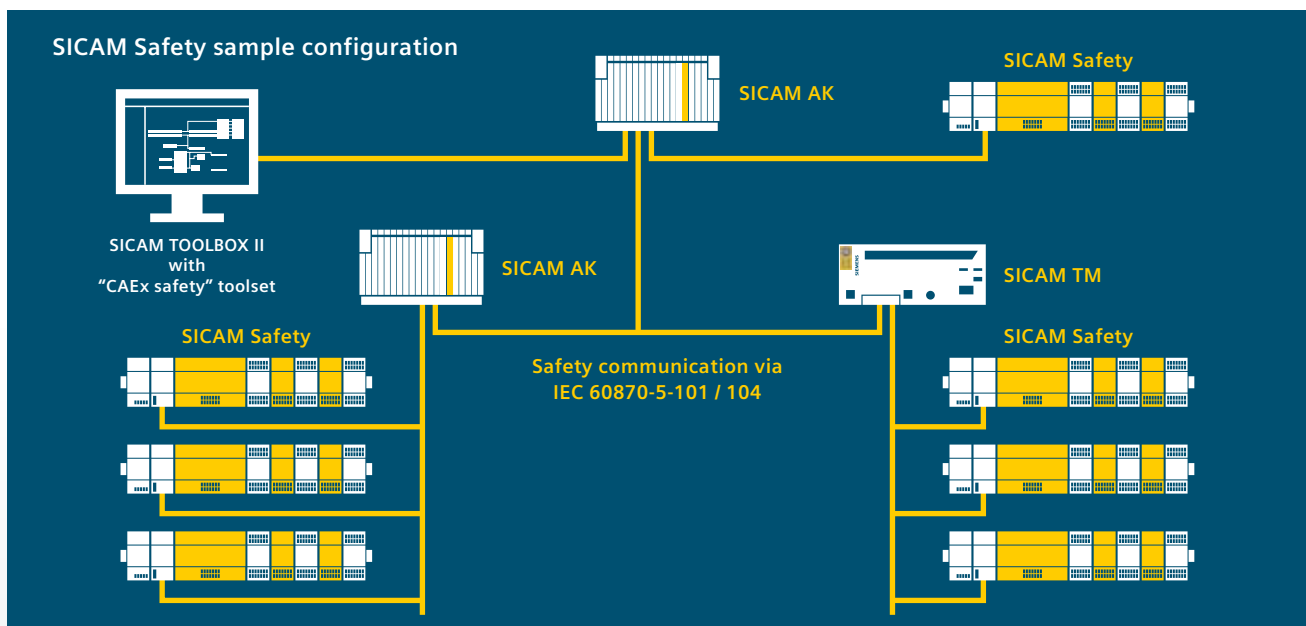
**Guaranteed reaction time:
100 ms from occurrence of
a criterion to triggering**

Count on proven solutions

- Standard and safety-related automation functions are separated.
- Communication which can be between a safety-related controller and safety-related peripheral equipment, or between a number of different safety-related controllers, is implemented in all cases using the PROFIsafe protocol – embedded in IEC standard protocols (IEC 60870-5-101 / 104).
- 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



SICAM Safety application on existing hardware

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

SICAM Safety application distributed between several locations

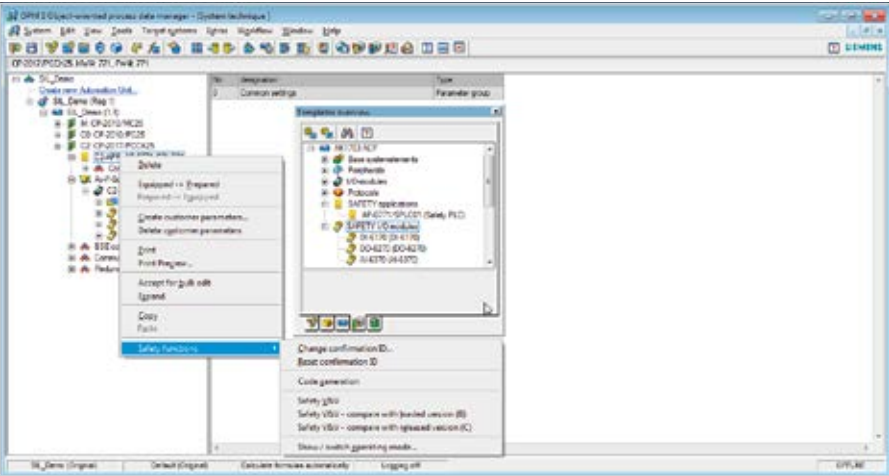
- The SICAM Safety application allows the integration of sensors or data from different localities – for example from
 - weir systems in large power plants
 - pumps in pipelines

- Distribution of SICAM Safety applications between several SICAM AK or SICAM TM automation units. The partial applications communicate securely via a standard telecontrol connection with standard protocol.

Use of SICAM Safety input/output modules

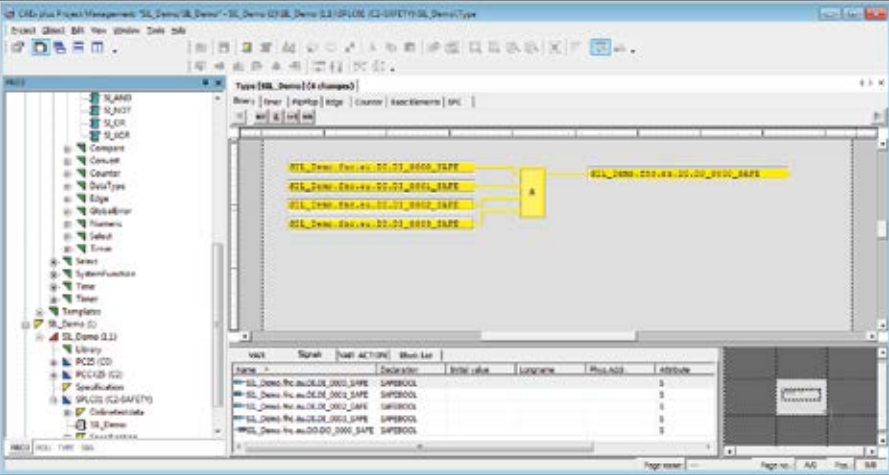
- Binary input and output for 24 V DC
- Analog input for 4 to 20 mA
- Thanks to the terminal module design, a mix of standard and safety modules is possible – also for retrofitting.
- The connection can be made via several lines – with a choice of optical and/or electrical.

Less effort for your engineering



Step 1

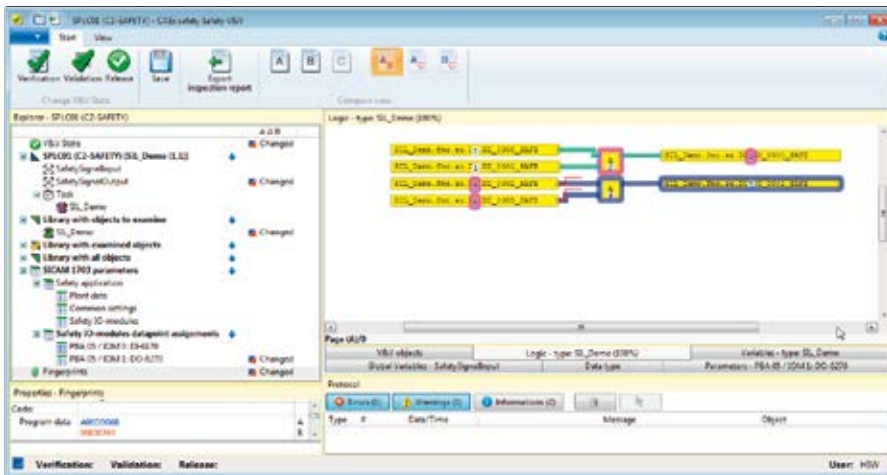
- Purchase license for the “CAEx safety” toolset.
- Install CAEx safety.
- Use all safety functions and applications.



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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