

What's the direct route to a safe machine?



Create your standard-compliant documentation fast and reliably with the Safety Evaluation Tool.

Answers for industry.

SIEMENS

Safety Evaluation Tool

Safe machine concepts without detours

The Safety Evaluation Tool for the IEC 62061 and ISO 13849-1 standards takes you to your goal directly. This TÜV-tested online tool from the Safety Integrated program by Siemens supports the fast and reliable assessment of your machine's safety functions. As a result, you are provided with a standard-compliant report, which can be integrated in the documentation as proof of safety.

A must:
Maximum safety for persons, machines and production

Functional safety is paramount for the protection of persons and machines: Particularly the correct function of a machine's or system's control and protection equipment must be ensured to realize an optimum safety level both for persons and machines as well as for production goods.

The means:
Risk analysis and protective measures

Risks are determined and assessed on the basis of the risk analysis, after which measures for risk minimization are defined.

On the safe side:
Compliance with the European Machinery Directive through standard-compliant documentation

Correct application of the IEC 62061 or ISO 13849-1 standard takes you on the safe side as it ensures compliance with the new directive, which will be mandatory as of the end of 2009. Application of one of these standards provides you with a high degree of legal security – the CE declaration of conformity, for which the standard-compliant documentation serves as proof.

Without detours:
Safety Evaluation Tool

The TÜV-tested online tool guides the user step by step – from specification of the safety system's structure to component selection, up to determination of the attained safety integrity (SIL/PL). As a result, you are provided with a standard-compliant report, which can be integrated in the documentation as proof of safety.



Step-by-Step Preparation of Standard-Compliant Machine Documentation with the Safety Evaluation Tool

With the Safety Evaluation Tool, you have opted for the easy way to prove your machine's safety as this online tool guides you through the process of result report preparation in a targeted manner.

When starting a new project, initially the safety areas are analyzed and the safety functions specified (step 1 to 3). In the next step, the sub-systems are created and filled with data (step 4). After evaluation of the overall result, you are provided with the final report which contains clear status information (step 5 and 6).

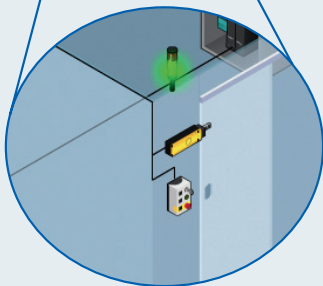
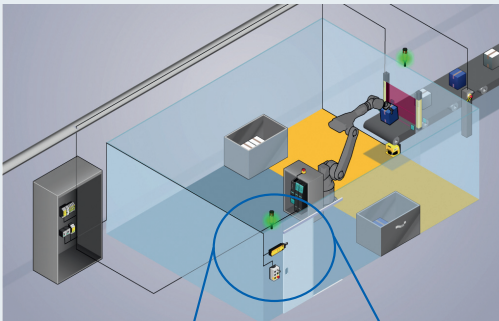


1st step

Definition of a safety function

E.g. the safety function
"Zone-based maintenance"

- Set the key-operated switch to Maintenance
 - Modular safety system generates signal for reduced speed (Safely Limited Speed) of the frequency converter
 - The door tumbler of the position switch is released and the door opened



2nd step

Selection of the standard, on which the calculations should be based

- IEC 62061 or
- ISO 13849-1

Create new project - Choose standard

Please choose the applying safety standard:

- IEC 62061
Safety of machinery Functional safety of safety-related electrical, electronic and programmable electronic control systems
- ISO 13849-1
Safety of machinery Safety-related parts of control systems - Part 1: General principles for design

3rd step

Description of the safety function

The safety function "Zone-based maintenance" consists of the sub-systems **detection** (position switches), **evaluation** (modular safety system) and **reaction** (drive)

Create new safety function - Choose layout

Layout of the safety function:


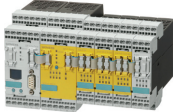

DETECTION > EVALUATION > ACTOR

or combinations of safety functions:

DETECTION+EVALUATION > ACTOR

DETECTION > EVALUATION+REACTION

DETECTION+EVALUATION+REACTION

Detection	Evaluation	Reaction
		
Position switches	Modular safety system	SINAMICS S120

Entry of the required PL or SIL

Consideration of safety integrity by IEC 62061

Required SIL: Please choose Please choose Find out

SIL 1

SIL 2

SIL 3

Other measures

Further functions

4th step

Creation of the sub-systems or the SRP/CS detection, evaluation, reaction

Data entry:

Product selection from the database

Name Sensor group S7 Connection Without

Type Customized required Architecture 2 Channels No. of components 2

Channel 1 Channel 2

Manufacturer Siemens Equipment identifier

Productgroup SRP/CS Detecting Devices DC (%) 99

Producttype Standard Position Switches B16 operation cycles 1000000

Integrated communication connection Without Rate of dangerous failures 20

Order number 5SES T1 (in years) 20

More order numbers ID 2.00 E-09

Consideration of safety integrity (IEC 62061)

Required PL or SIL: SIL 3

PFHD: 2.00 E-10

SIL CL	SIL 3
PFHD	2.00 E-10

Result:

Safety Integrity Level (SIL) or Performance Level (PL) and PFHD of the sub-system or SRP/CS

5th step

Determination of the overall result

The screenshot shows the Siemens Safety Evaluation Tool (SET) interface. A red box highlights the 'Achieved SIL' and 'Achieved PFHD' values for a specific functional area.

Functional area	Achieved SIL	Achieved PFHD
Functional area 1	SIL 2	5.53 E-06

6th step

Preparation of the result report for machine documentation

The screenshot shows the report generated by the Safety Evaluation Tool. The report includes the following information:

Report Date: 4/15/09

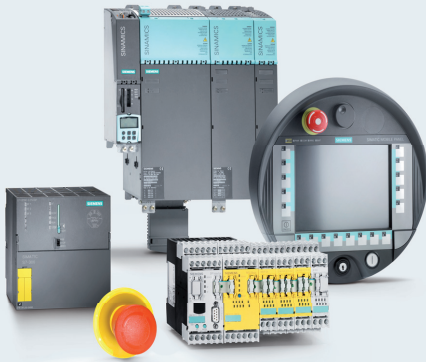
Safety Evaluation Tool

Name: Company XY
Safety standard: IEC 62061, Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems
Manager: Bill Smith
Inspector: John Smith
System type: Conveyor
Document risk analysis: Hazard_analyse.doc
Description:
SET version:
Product data version: 1.00

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The Safety Evaluation Tool forms part of Safety Integrated, the intelligent safety solution by Siemens with a full-range product portfolio. Our certified safety technology complies with all relevant standards and is already incorporated in the Safety Evaluation Tool.

Further information on increased safety and productivity is available at:
www.siemens.com/safety-integrated

Application of the standards and the use of certified products minimize expenditures and risks. Siemens Safety Integrated products are certified in accordance with the relevant manufacturer standards and can be comfortably called up in the tool together with manufacturer specifications.

Relevant user standards:

IEC 62061

Safety of machinery – Functional safety of electrical, electronic and programmable control systems

ISO 13849-1

Safety of machines – Safety-related parts of control systems,
Part 1: General principles for design

Safety Evaluation Tool – your advantages at a glance:

- Safety regarding compliance with standards: Automatic calculation in accordance with current standards
- Rapid result: Standard-compliant report
- TÜV-tested tool
- Time savings in terms of safety function assessment
- Fast access to current product data
- Comfortable archiving: Projects can be saved and called up again as required
- Fast and easy handling: Comprehensive, pre-defined example libraries
- Free use of the online tool*
- Worldwide service and support

(* Only the usual costs for Internet access accrue)

Siemens supports you!

As your partner for all safety issues, we not only support you with the respective safety-oriented and certified products and systems, but also with our up-to-date know-how on international standards and regulations. We offer comprehensive training measures for machine manufacturers and system operators as well as services over the entire service life of safety-technical systems and machines.

You require more information?

Please refer to:

Service & Support: www.support.automation.siemens.com

Training/standards training: SITRAIN Safety

Contact: www.siemens.com/sitrain-safetyintegrated

All information on Safety Integrated:

www.siemens.com/safety-integrated

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