

## Functional Safety

Global Reach — Local Service

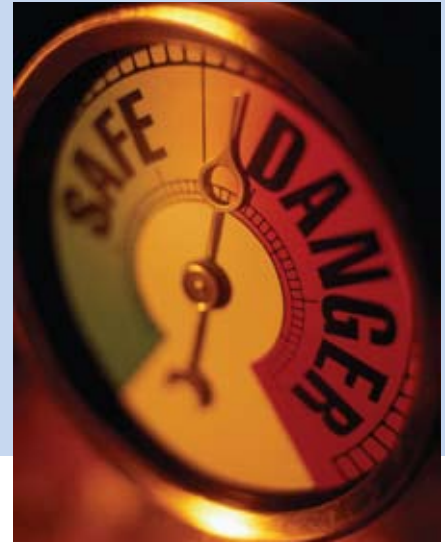
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**TÜVRheinland**<sup>®</sup>  
Precisely Right.

# Functional Safety

According to IEC 61508, Functional Safety is the part of an overall safety profile that pertains to a system or equipment operating correctly in response to specific inputs. Functional safety assessments ensure that the device and integrated system comply with safety risk guidelines.



Since 1980, TÜVRheinland® has been finding solutions to challenges relating to assuring the safety and reliability of:

- Programmable or configurable controllers with safety functions
- Safeguards and safety components at machinery (electro- sensitive protective equipment, etc.)
- Drive systems with safety functions
- Bus systems, devices with safety related bus communication
- Software products (compiler, programming and configuration tools, operating systems)
- Elevators, conveyors

The modern, well-equipped laboratories and testing facilities located in the US, Germany and Japan can provide cost effective solutions to a wide range of safety, reliability and quality issues. TÜVRheinland® offers the capability to provide the accreditations that global manufacturers need for an international marketplace.

## Type-Approval for Systems, Devices and Components

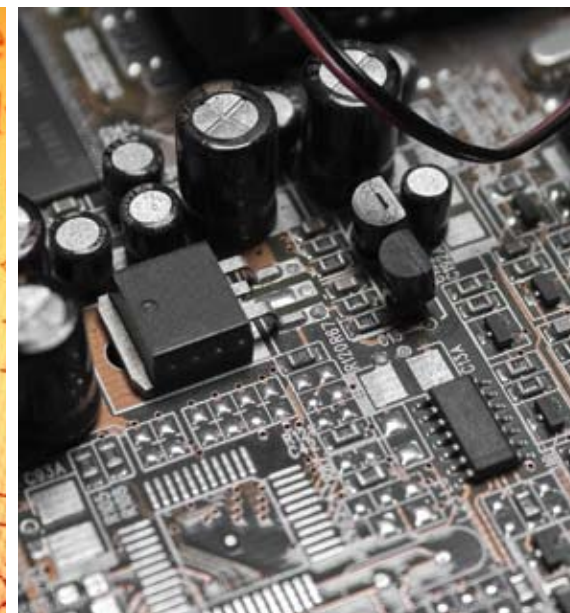
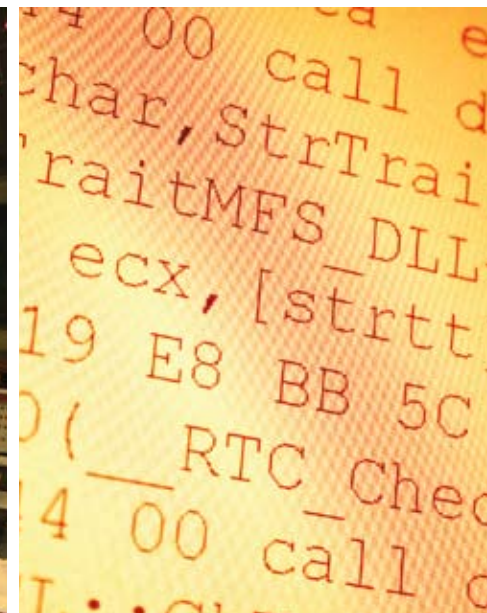
As the market leader in providing manufacturers the proper services for all major global standards, TÜVRheinland® performs type-approvals to ensure that products with safety functionality meet the requirements of the targeted safety classification (e.g. SIL, PL, etc.). Conformance to the requirements of national and international standards (e.g. IEC 61508, IEC 61511, IEC 62061, NFPA 79, ISO 13849, UL 61496, etc.) is critical to ensure a product's suitability for its intended application.

Specific procedures, techniques and measures have to be used to achieve the needed safety classification. The type-approval approach, which is a core competence, proves the compliance of the product to the targeted safety classification.

The type-approval consists of two parts: the concept review and the main assessment.

- The concept review assesses the equipment's principal performance and requirements, and identifies any concept deficiencies
- The main assessment includes a theoretical and practical inspection, which may include:
  - Safety parameter calculations
  - Failure Mode and Effect Analysis (FMEA)
  - Software assessment
  - Environmental tests, EMC and electrical safety
  - User documentation review

The TÜVRheinland® FS type-approved certificate, which is recognized worldwide as proof of functional safety, is issued for products that fulfill the applicable standard requirements.



As a world leader in compliance testing and certification since 1872, TÜVRheinland® offers you the expertise and attention-to-detail you need to guarantee customer satisfaction, and will help you bring your products to global markets — quickly, economically and with a worldwide-recognized mark.



## Global Reach – Local Service

### Training

Vocational qualification training of the TUV Functional Safety Program is offered by the experts at TÜVRheinland®. This training provides engineers and managers with information needed to attain credentials in the IEC 61508, IEC 62061 and ISO 13849 international standards.

Engineers who are already working in the field of functional safety also have the option to obtain an official verification of their expertise. By passing an optional final exam they will receive a TUV Functional Safety Engineer certification. All training participants will receive a letter of completion for the course.

This certificate, which is acknowledged worldwide, states that specific knowledge within the field of “Hardware/Software Design according to IEC 61508” or “Functional Safety in Machinery” (depending on course) has been achieved.

### Expert Services

The service provided is the best way for manufacturers, system integrators and end-users to navigate the maze of product requirements driven by the various standards. The team is always up to date with the latest regulatory requirements and can help your organization understand the impact of the applicable requirements and standards.

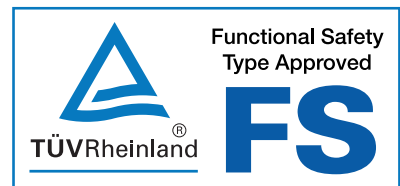
TÜVRheinland® can provide subject matter experts to guide you through the very costly and time intensive areas of retest, redesign and rework mandated by these evolving safety standards. With an awareness of these standards early in your design cycle, safety function roadblocks can be eliminated assuring an on-schedule project completion.

### Why TÜVRheinland?

- TÜVRheinland® is a certified and accredited entity:
  - Nationally Recognized Test Laboratory (NRTL) accredited by OSHA to certify to UL and other US standards, and by SCC to certify to CSA and other Canadian standards
  - TÜVRheinland® Group is a European Notified Body, authorized to certify to EU Directives (Machinery, Elevators, Low-Voltage, Pressure equipment, ATEX and EMC)
- TÜVRheinland® type-approvals cover the entire range of test mark requirements, including Functional Safety, EMC and Product Safety (LVD)
- Vocational functional safety training is available for engineers and managers under the TÜV Functional Safety Program
- This broad scope of equipment and technical capabilities ensures a timely and well executed project.
- Global capabilities to accommodate multi-site design and manufacturing centers

### Examples of Functional Safety Marks

(not all inclusive)



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We can help get your products to market quicker



## TÜVRheinland®

Precisely Right.

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TÜVRheinland® is the world leader in independent testing and assessment services. The \$1.5 billion corporation is comprised of an international network of 12,500 employees at over 360 locations in 62 countries and serves most industry sectors and markets worldwide. With North American headquarters in Newtown, Conn., TÜVRheinland® has additional offices throughout North America.

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