



Rail

Choose certainty.  
Add value.

# Safety in Electronics

Automation, Software and Electronics – IQSE

TÜV SÜD Rail GmbH

TÜV®

## Knowledge for your progress and success.

TÜV SÜD Rail GmbH is an enterprise of the TÜV SÜD Group which offers technical support with more than 13,000 employees at more than 600 locations worldwide. TÜV SÜD Rail GmbH as a leading service provider in the field of safety engineering offers constructive support by training courses, testing and certification. This global support is running early at the beginning of a development in all project phases from preliminary development up to maturity for series production or acceptance procedures.

We can draw on more than 30 years of experience as a neutral Testing Site and Certification Agency, accredited for all relevant technical standards (such as IEC 61508, IEC 62061, ISO 13849-1, 98/37/EC).

Our specialists are prepared for training and finding solutions in questions of safety, quality and availability, as well as for certification in the areas of:

- Programmable Logic Controllers (PLC)
- Safety components for machinery
- Software
- Safety related communication and bus systems
- Safety process integration (Functional Safety Management – FSM)
- Process control engineering/-automation
- Mechanical components





## Maximum know-how for your success.

### What can we do for you?

Actually, this can be explained very easily: We will attend you beginning from elaborating the concept up to the maturity of your products for series production, including the accompanying processes and the necessary acceptance procedures.

This means fast and effective service all around safety engineering of electronics, both on the level of systems and applications and also processes.

### Are experience and competence important for you?

Here is a small selection from our previous activities:

- Programmable Logic Controllers (PLC)
- Safety components for machinery
- Data protocols and bus systems
- Remote control systems
- ASIC, GA, FPGA
- Sensor/ Actuator technology
- Software tools
- Operating systems and many more

### Accredited with international recognition

The certificates and marks of conformity granted by TÜV SÜD enjoy high recognition worldwide and are considered as figures of merit providing a neutral and reliable assessment for electronics.

We have been authorized by international accrediting authorities to test and to certify according to international safety standards and quality standards.

### We have been accredited with reference to:

- Safety testing of electrical and programmable measuring, control and automation systems
- EC Type Examination for safety devices according to the Machinery Directive 98/37/EC Annex IV B1-3
- Testing of safety controllers for specific applications (i.e. burner control, elevator, cableway, ...)
- Testing of software
- Certification of software tools and operating systems
- Testing of devices according to the Low Voltage Directive



## Training



The effects of the standards for safety-relevant systems, processes and applications are extensive. We offer you a wide and modularly composed range of training courses all about safety electronics.

The training courses range from generic training on IEC/EN 61508 and standards of application, risk analysis, system design and analysis, FMEA/FTA, probabilistic, safety-relevant software up to adjustment and accordingly optimizing of processes with regard to Functional Safety.

## Testing

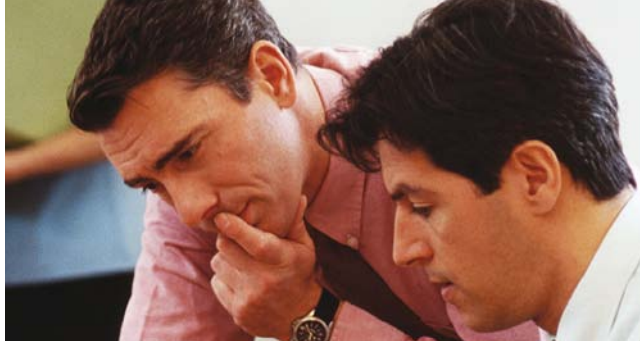


Today in all sectors of industries – process, energy, manufacturing and transportation – the most complicated procedures are controlled by efficient computer systems. Availability and safety are the major quality criteria. Faults do not merely cast doubt on the operational efficiency of processes, but also pose a threat to people, their environment and property. As a global market leader for the certification of programmable controllers related to safety we assist with reducing the risks as far as possible while remaining economically viable, demonstrating the safety of the system in the event of an error in the hard- or software and at the same time ensuring optimal availability.

## Certification



For both, areas regulated by the law and product safety efforts, our certificates serve as neutral proof for levels of safety and quality. With our independent certification body, we have gained extensive experience in certification according to various different international standards – of course based on all relevant accreditations. We will support you by confirming with certificates based on our tests the quality and safety characteristics of your systems and processes. We grant marks of conformity, as e.g. “Functional Safety”, enabling you to show the high quality of your products or processes in the market.



- **Generic and basic training courses**

Modularly arranged training courses with individual focus impart knowledge independent from specific projects, concerning the development of safety electronics and the application of standards.

- **Coaching**

Support for the implementation of Functional Safety requirements by experienced coaches, e.g. in specific projects and with problems and questions, respectively, and if required in supplementary workshops.

- **Individual training courses**

Providing an opportunity to arrange the contents of a course according to your own needs and requirements, e.g. in individual, short-time courses.

- **Training program for Certified Functional Safety Expert (CFSE)**

Qualification as Certified Functional Safety Expert.

- **System analyses**

- Risk analyses, specification of safety requirements
- Concept analyses
- Design analyses (diagnostics mechanisms/ software architecture)
- Verification & validation

- **Software analyses**

- Auditing and evaluation of software development processes
- Review activities (e.g. Software Criticality Analysis)
- Validation and verification in all phases of the life cycle

- **Environment simulation and testing of electromagnetic compatibility**

- **Testing of Electrical Safety**

- **Hardware analyses/probabilistic methods**

- Reliability analyses
- Availability analyses
- Markov-analyses
- Failure effect & fault-tree analyses (FMEA, FMECA, FMEDA, FTA)
- Fault insertion tests (FIT)

- **Optical tests**

- **Certification of electronic systems for their Functional Safety**

- **EC Type Examination and certification for safety devices according to the Machinery Directive 98/37/ EC Annex IV B1-3**

- **Certification of applications**

- **Certification of company – FSM**

- **Certification of devices and protection systems for use in areas exposed to explosion hazards (Ex-protection)**





Rail



[www.tuev-sued.de/rail](http://www.tuev-sued.de/rail)

**Collaborating with us, you are on the safe side.**

The specialists of TÜV SÜD Rail GmbH, are well prepared to provide optimum service to you everywhere in the world, from Europe via North America to Asia.

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Rail Automation

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