



UL's Functional Safety Evaluations Help Increase Market Acceptance

For more than a century, UL has been one of the most recognized and trusted resources for product safety testing and certification. UL assists manufacturers in gaining access to both domestic and global markets.

As systems rely more and more on sophisticated hardware and software, safety is increasingly dependent on a proper operation in response to the input. Functional safety is part of the overall safety that depends on a system or equipment operating correctly in response to its inputs. Neither safety nor functional safety can be determined without considering systems as a whole and the environment with which they interact.

A functional safety evaluation includes:

- Software
- Hardware
- Environmental Factors, such as EMC
- Safety lifecycle management processes

UL provides integrated testing services to address all your compliance needs through one expert resource.

Why evaluate your product for functional safety?

A functional safety assessment can determine that your products meet standards and performance requirements created to protect against potential injury or death. There are many reasons to seek functional safety certification including but not limited to:

Customer requirements — Your own customers may demand functional safety evaluation before purchasing equipment

Market acceptance — Marketing products as having a functional safety certification helps maintain your product's competitiveness in the marketplace

Legislation — Legislative requirements such as some European Directives require a functional safety evaluation

Regulations — Some regulatory bodies such as Occupational Safety and Health Administration (OSHA) require or encourage functional safety evaluation

Trade unions — Some unions require or encourage functional safety certified products in the workplace

Insurance Companies — Your customers' insurers may require a functional safety evaluation before the customer installs the equipment in the workplace or the insurer may provide discounted premiums to customers that use products evaluated for functional safety

UL deliverables

- Advisory services that can provide assistance with:
 - Calculation or verification of Safety Integrity Level (SIL), Performance Level (PL), or Class, etc.
 - Validation Plans
 - Failure Modes, Effects, and Diagnostic Analysis (FMEDA)
 - Failure Modes and Effects Analysis (FMEA)
 - Functional Safety Management Plan
 - Integrated Test Plan, including identifying appropriate environmental conditions for testing (such as humidity, EMI, vibration, etc.)
 - Safety Case, including development of risk analysis
 - Safety Manual
 - Safety Plans
 - Safety Requirements Specification (SRS)
 - Software FMEA/Software Hazard and Operability (HAZOP) Analysis



- Functional Safety Listing Mark
- Functional Safety Component Recognition Mark
- Informative test reports
- 3-year Functional Safety Certificate
- Type examination reports

UL can help you navigate the complexity of functional safety standards such as IEC 61508.

Functional safety standards

UL can evaluate safety-related products to a variety of standards, including but not limited to:

IEC 61496 — Evaluation of safety-related electrosensitive protective equipment

IEC 61508 — Functional safety of products, components and systems. Evaluation covers electrical/electronic/ programmable electronic (E/E/PE) safety-related systems and assessment of the proper safety integrity levels (SILs) of your product or system

IEC 61511 — Safety for instrumented systems for the process industry sector

IEC 61800-5-2 — Safety for adjustable speed electrical power drive systems

IEC 62061 — Safety of machinery and functional safety of safety-related electrical, electronic and programmable electronic control systems

ISO 10218 — Safety requirements for robots used in industrial environments

ISO 13849 — Safety of machinery and safety-related parts of control systems

ISO 26262 — Road vehicles-Functional safety

This is an example of what the marks look like with the marking elements included:



PROGRAMMABLE CONTROLLER
(XXXX)
ALSO EVALUATED IN ACCORDANCE WITH
IEC 61508 1ST ED. 1998, up to SIL 3 AND
ISO 13849 2ND ED. 2006, up to PL E
See installation manual for safety functions

Functional safety product categories

Safety-related applications, such as light curtains or safety-programmable controllers, carry greater implications for human safety and equipment damage than products typically used in an industrial environment. A functional safety assessment help establish that standards and performance requirements designated to protect against potential injury or death are met. Common products that receive functional safety evaluations include:

- Burner management systems
- Combustion controls
- Electrosensitive equipment
 - Laser scanners
 - Light curtains
 - Machine vision equipment
- Elevator components
- Gas detection equipment
- Motor drives
- Process control equipment
- Programmable components
- Programmable logic controllers (PLCs) and programmable automation controllers (PACs)
- Robotics and accessories
- Safety relays and protective relays
- Wind Turbine Controls

Why UL is your best choice for functional safety evaluations

Highly responsive to unique technical needs

UL is the worldwide leader in certifying products' safety and conformance to universal and market-specific regulatory standards. In fact, we've been testing products for more than 100 years.

Our deep technical expertise gives us the flexibility to work with the demands and specifications you provide for each project to meet your request. We tailor the service offering to meet your individualized product evaluation needs.

If you are interested in finding out if UL's Functional Safety Evaluations are right for you, contact Kevin Connelly at +1.631.546.2691 or at Kevin.Connelly@ul.com.

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