

SAFETY FUNCTION AND SIL LEVEL



SIF

Safety Instrumented Function

Safety function with a specific safety level, necessary to reach or maintain a safe state.

- Protection Function
- Mitigation Function
- Control Function

SIS

Safety Instrumented System

Series of devices and software that perform one or more safety instrumented functions, consisting of:

- Subsystem
- Element
- Component
- Safety Instrumented Function

SIL

Safety Integrity Level

Discrete level (from 1 to 4), corresponding to a range of safety integrity values, used to specify the safety integrity requirements of the safety functions to be assigned to E/E/PE safety systems.

SIL REQUIREMENTS

Systematic
Capability

Architecture
Constraints

PFD_{avg}
o PFH

Safety Integrity Level (SIL)	Average probability of a dangerous failure on demand of the safety function (PFD _{avg})
4	$\geq 10^{-5}$ to $< 10^{-4}$
3	$\geq 10^{-4}$ to $< 10^{-3}$
2	$\geq 10^{-3}$ to $< 10^{-2}$
1	$\geq 10^{-2}$ to $< 10^{-1}$

Safety Integrity Level (SIL)	Average frequency of a dangerous failure of the safety function [h ⁻¹] (PFH)
4	$\geq 10^{-9}$ to $< 10^{-8}$
3	$\geq 10^{-8}$ to $< 10^{-7}$
2	$\geq 10^{-7}$ to $< 10^{-6}$
1	$\geq 10^{-6}$ to $< 10^{-5}$

OPERATING MODES

Low Demand
Mode

< 1 volta/anno

High Demand
Mode

> 1 volta/anno

Continuous
Mode

Normale
funzionamento