

*SILcal V.9 is developed by
exida Development s.r.l Italy*

The main logo for SILcal V.9. "SIL" is in large red letters, "cal" is in large grey letters, and "V.9" is in smaller grey letters with a red "9". A small "exida" logo is positioned above the "cal" part.

SILcal_{V.9}

Full integrated **Safety Analysis Tool**

SILcal is an integrated tool suite to perform all safety analyses required by **ISO 26262 / IEC 61508** for the development of safety critical systems and their hardware and software components.

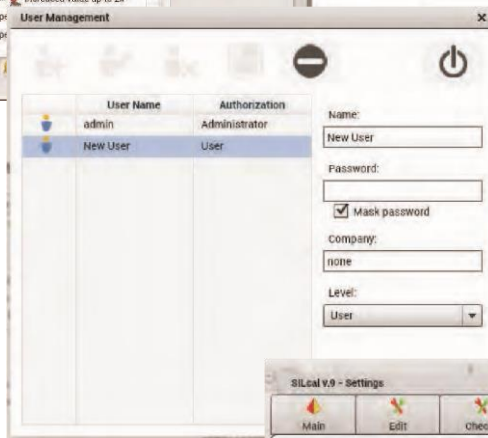
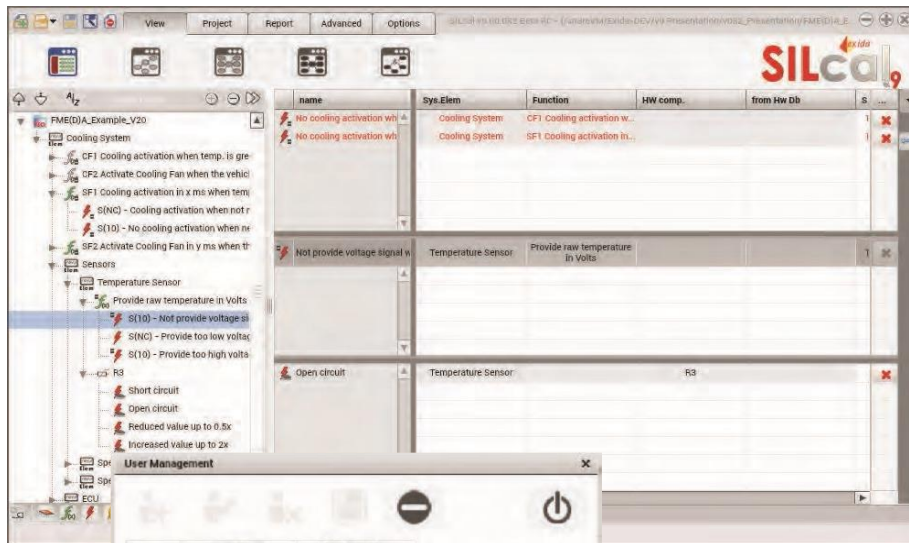
Packages

- **SILcal v9 BASE**
(FMEA - SW FMEA)
- **SILcal v9 FULL**
(FMEA - FMEDA - SW FMEA - FTA - DFA)

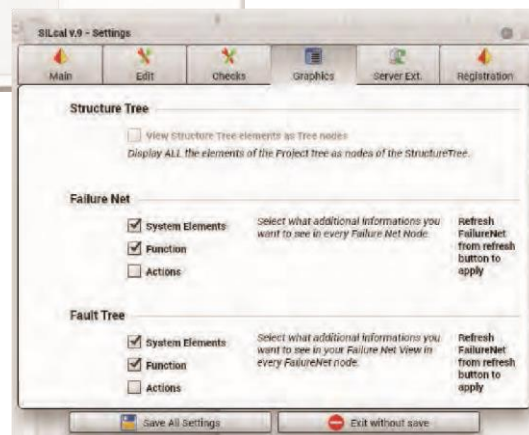
Key feature description

- **FMEA** – full support to Failure Mode Effects Analysis, including process management, compliant with AIAG&VDA 2019 standard.
- **FTA** – automatic generation of Fault Tree Analysis from FMEA failure model, cut-set analysis and PMHF calculation. (not available on the current release)
- **DFA** – Identification of common cause initiators from FTA and exida DFA guideline.
- **FMEDA** – integration with FMEA, compliant with ISO 26262 and IEC 61508.
- **Failure rates** and **failure mode** distribution from industry standards (SN 29500, IEC TR 62380, etc.) and exida hardware component database.
- **SW-FMEA** – Keyword based analysis of software failure modes. Support from exida SW-FMEA guideline.
- **Consistency** – Internal consistency between all safety analyses is guaranteed due to common data structure and aligned analysis methodologies.

Personalizable and integrated editing view



Usermanagement



SettingsforGUPersonalization



Proprietary file with imports from many other FMEA/FMEDA tools.



Availability of a lot of Library files to speed up your work. Is it also possible to create your own library and share it with your working group.

One Input → Many Output

The screenshot displays the SILcal software interface, illustrating the flow from component configuration to analysis results. The interface is divided into several key sections:

- Component info:** Shows configuration for a component named 'R3' (Thermistor, NTC). It includes fields for quantity (1), percentage of load (100.00%), failure rate (3.000), and component number (SN29500).
- Failure Modes and Functions:** A table listing failure modes and their associated effect names.

Failure Mode name	Distr.	Effect Name
Short circuit	10.0 %	
Open circuit	30.0 %	
Reduced value up to 0.5x	30.0 %	
Increased value up to 2x	30.0 %	
- ISO 26292 RESULTS:** A summary of safety analysis results for the 'S(10) - No cooling activation when needed (>=100°C AND 9 ms elapsed)' function. It lists various failure rates (e.g., SF: 2.180E-6, SPF: 5.400E-6) and metrics like ASIL(A) and Total Failure Rate (1.419E-2).
- IEC 61508 RESULTS:** A summary of IEC 61508 safety analysis results, showing metrics such as Safe Failure Fraction (96.18%), Total Failure Rate (1.002E-2), and MTBF (525 Years).
- Advanced info:** A detailed fault tree diagram showing the relationship between the 'Cooling System' and various failure modes like 'Short circuit', 'Open circuit', and 'Temperature sensor conditioning (trip)'. It includes logic gates and associated failure rates.

Modules

Note: the following table give simple indication on how SILcal v9 could be used in different field and for different purposes.



	Quality	Safety	OBM	Tier 1	Tier 2	Product Analysis	Consultants	
	Usage		Automotive User			Process Industry /Others		Description
FMEA	✓	✓	✓	✓	✓	✓	✓	Basic module requested to use all others
SW-FMEA	✓	✓	(✓)	(✓)	✓	(✓)	✓	HAZOP software analysis including specific Library
FMEDA	x	✓	x	x	✓	✓	✓	FMEDA HW Analysis for electronic and mechanical systems
FTA	(x)	✓	✓	(✓)	x	(✓)	✓	Graphical Input and calculation from basic item failure rate to system
DFA	✓	✓	✓	x	✓	(✓)	✓	Analysis starting from dedicated library file for different standards

✓	Requested Use
(✓)	Suggested Use
x	Normally not used

Licensing

Standalone version:

- Node Locked
- Floating, with HW Dongle Key

Platforms:

- Microsoft Windows (7 or higher)
- Mac OS X (10.5 or higher)

excellence in *Dependable Automation*



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