

A large abstract graphic background consisting of overlapping, semi-transparent geometric shapes in shades of orange, red, and yellow, set against a light grey grid pattern.

# **BREAK** *through* the **CLUTTER**

The future of the completely integrated safety lifecycle tools has arrived.

*exSILentia*<sup>®</sup> v4 **completely integrates**  
*all safety lifecycle tools. Data is seamlessly*  
**exchanged between the different**  
**phases of the safety lifecycle ensuring**  
**efficiency and consistency** *in all your*  
**safety lifecycle**

# Introducing exSILentia® v4

exSILentia® v4 is a completely **integrated suite of engineering software tools** designed to support the **Process Safety Management (PSM)** work process and the **Safety Instrumented System (SIS) Functional Safety Lifecycle**. exSILentia v4 enables data to be seamlessly shared between different lifecycle steps. Cause-consequence pairs identified during the **Process Hazard Analysis (PHA)** can be grouped in Hazard Scenarios. High risk hazard scenarios can be flagged for further evaluation using **Layer of Protection Analysis (LOPA)**. Causes are automatically identified as the initiating events in LOPA, safeguards related to the cause-consequence pairs are the starting point of the protection layers to be considered in the LOPA.

The hazard scenario accident frequency that results out of the LOPA is an input into the **SIL target selection**. If the accident frequency is higher than the consequence based tolerable frequency this will lead to a risk reduction requirement for, for example, a **Safety Instrumented Function (SIF)**. exSILentia v4 makes it possible to directly assign a risk reduction requirement to a SIF in the LOPA. In both cases this risk reduction requirement and the need for a SIF lead to the creation of a **Safety Requirements Specification (SRS)**. Information from the PHA, LOPA, and SIL target selection will feed directly into the SRS.

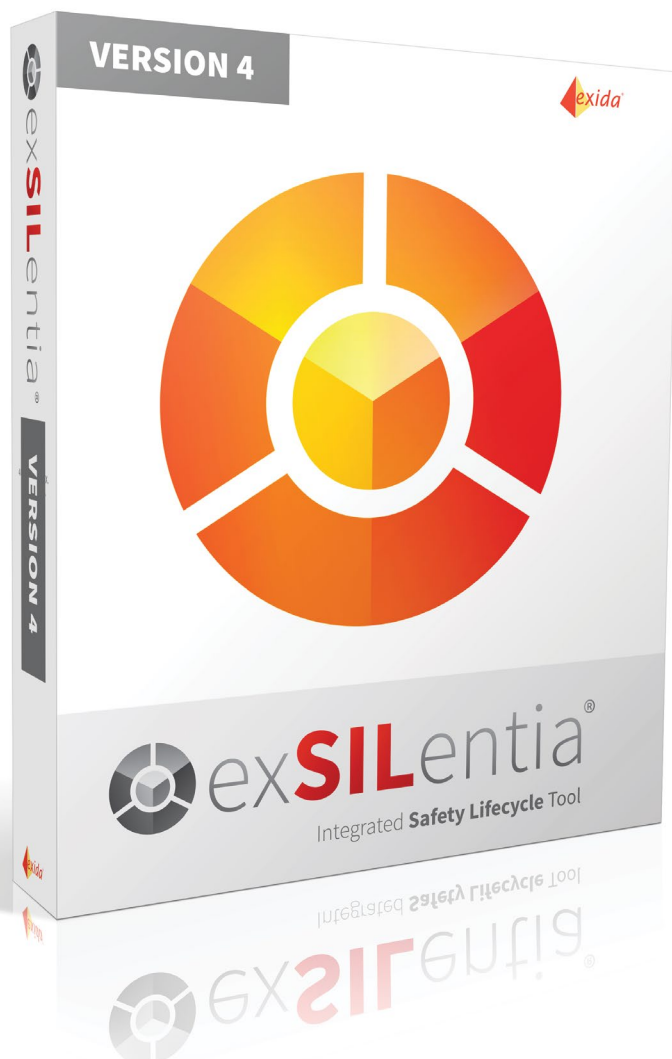
exSILentia® v4 is a completely integrated suite of engineering software tools designed to support the Process Safety Management (PSM) work process and the Safety Instrumented System (SIS) Functional Safety Lifecycle.



Safeguards identified as SIFs are linked automatically to the aforementioned Safety Requirements Specification (SRS), significantly enhanced in exSILentia v4 and the world leading conceptual design **evaluation/SIL verification tool SILver™**. The detailed modeling in the SILver is even further extended, providing the user with more options to model more complex configurations as well as taking real life concerns like maintenance effectiveness into consideration. The embedded **Safety Equipment Reliability Handbook (SERH) database** is further extended and the associated SERH viewer functionality is also improved.

The results from the conceptual design lead to the definition of a design SRS, a detailed design input document that specifies implementation requirements for the evaluated SIF. Consider proof test and partial stroke test intervals as well as preventative maintenance requirements to ensure impulse lines remain unplugged.

The exSILentia v4 proof test generator is significantly enhanced to better support transfer of design information to the exida **SILStat™** software, minimizing operational event tracking setup time and cost. Additionally users will be able to define proof test while they are documenting the conceptual design, ensuring that all important lifecycle information is documented in a single source.



exSILentia v4 is the ultimate Safety Lifecycle tool, allowing for extensive report generation in Microsoft Word and Microsoft Excel.

Sharing data for multi-person projects or for independent review is simplified using the exSILentia v4 proprietary file format.

## ***Process Safety Management and Functional Safety Lifecycle support in a single tool***

The use of a single tool for the Process Safety Management and Functional Safety Lifecycle activities means a single tool can hold all relevant PSM information. Therefore a single source of relevant PSM information will be used during an audit to demonstrate compliance with national and local standards. Supporting a wide variety of imports and export capabilities allows continuous support for legacy systems.

**exSILentia 4 is available as eight different options, all of which combine lifecycle activity tools for a users' specific set of functionality requirements, budget, and relevant engineering tasks:**

- » **PHA** - Process Hazard Analysis tool
- » **LOPA** - Layer of Protection Analysis tool
- » **PHA + LOPA** - Combined Process Hazard Analysis and Layer of Protection Analysis tool
- » **Alarm** - Alarm Rationalization tool
- » **Standard** - Base functionality for all users requiring Functional Safety standard compliance
- » **Analysis** - Additional functionality for the Process Hazards Analysis phases of the Process Safety work process and Safety Lifecycle
- » **Operation** - Additional functionality for the Operation phases of the Safety Lifecycle
- » **Ultimate** - Complete exSILentia Safety Lifecycle tool functionality














# VERSION 4 Options

Safety Lifecycle Phase / Activity	exSILentia® Module	Module Functionality	PHA	LOPA	PHA + LOPA	ALARM	STANDARD	ANALYSIS	OPERATION	ULTIMATE
Functional Safety Management, Auditing and Assessment	IEC 61511 Compliance Documentation	Checklist for Documenting Compliance with IEC 61511 Standard	✓	✓	✓	✓	✓	✓	✓	✓
Safety Lifecycle Structure & Planning	N/A									
Hazard & Risk Assessment (Process Hazard Analysis)	PHAx™	Record results of Process Hazards Analysis (PHA) / Hazard and Operability Study (HAZOP)	✓		✓			✓		✓
Allocation of Safety Functions to Protection Layers (SIL Target Selection)	LOPAx™	Likelihood Analysis		✓	✓			✓		✓
	SILect™	Safety Integrity Level (SIL) Selection (Risk Graph, Risk Matrix, Frequency Based Targets)					✓	✓		✓
	SILAlarm™	Alarm Rationalization per ISA 18.2, EEMUA 191				✓				✓
Safety Requirements Specification (SRS)	Process SRS	Process level Safety Requirements Specification					✓	✓	✓	✓
Design and Engineering of SIS (incl. SIL verification)	SILver™	Safety Integrity Level Verification, IEC 61508 compliant calculation engine					✓	✓	✓	✓
	SERH Viewer	Viewer for exida Safety Equipment Reliability Handbook database (over 2000 devices)					✓	✓	✓	✓
	Lifecycle Cost Estimator	Evaluate Lifecycle cost of proposed SIF designs							✓	✓
	Design SRS	Detailed Design level Safety Requirements Specification								✓
	SRS <sup>CAE</sup>	Creation of SIF and SIS Cause & Effect matrices								✓
Installation, Commissioning, and Validation	N/A									
Operation and Maintenance	Proof Test Generator	Creates proof test procedures for each component (organized by SIF)							✓	✓
Modification	SILStat™	Recording of SIF life event data (proof test results, failures, demands) for comparison of actual to expected performance								
Decommissioning	N/A									
Verification	Built-in	Peer review capability based on login allows review / approval of tool output	✓	✓	✓	✓	✓	✓	✓	✓



## Key Features

exSILentia v4 is a significant extension of the exSILentia platform, as it improves overall consistency of Process Safety/Functional Safety tasks and reduces the effort needed to maintain information. The tool can easily be used by multiple cross functional disciplines or for single lifecycle tasks. Key features of exSILentia v4 include:

	Full integration of all lifecycle phases		Seamless Data Flow
	Hazard Scenario basis for LOPA and SIL selection		Libraries (safeguards, recommendations, references, hazard scenarios)
	User Customization of : <ul style="list-style-type: none"> <li>• PHA smart deviations</li> <li>• Risk matrix, dimension, and risk receptors</li> <li>• Custom Data, e.g. process safety information for alarm rationalization information, relief valve sizing etc.</li> </ul>		Improved user friendliness : <ul style="list-style-type: none"> <li>• PHA recording without touching the mouse (just use keyboard commands)</li> <li>• Wealth of short cuts</li> <li>• Easy copy/paste, move within projectsizing etc.</li> </ul> Allow opening of multiple instances, copy and pasting between instances
	Improved data export capability		Logic solver with multiple AI/DI/AO/DO modules as well as TC and RTD modules
	Ability to hyperlink references		Ability to embed references
	Improved data import capability		

## Seamless Data Flow from one Task to the Next

The benefit of an integrated lifecycle tool is the seamless exchange of data between lifecycle tasks. With exSILentia v4, data will flow from the Process Hazard Analysis (PHA) all the way to exida's life event recording software SILStat.

Tool	Data Element
PHAx™	Cause-Consequence pairs are linked to Hazard Scenarios
LOPax™	Likelihood analysis per Hazard Scenario Identified causes are initiating events Identified safeguards are starting point IPLs
SILect™	Use Hazard Scenario accident frequency in Required Risk Reduction based SIL target Selection
SRS	Define safety requirements for IPLs of type SIF with a Required Risk Reduction greater than 1
SILver™	Determine achieved SIL for SIFs
Proof Test Generator	Define proof tests for SIF equipment
SILAlarm™	Safeguards/IPLs of type ALM flagged for rationalization SIF diagnostic Alarms flagged for rationalization
SILStat™	Import complete exSILentia® v4 project file consisting of defined Hazard Scenarios, IPLs, and SIFs Automatically configure plant hierarchy, devices, proof tests and their schedules

## ***Flexible licensing to support a variety of applications and project teams***

exSILentia v4 is available on four different licensing platforms to accommodate safety engineering teams, either co-located or distributed around the world:



### **STANDALONE**

The software is installed on the user's PC. A USB license key is provided for each user. Software can be installed on an unlimited number of PCs. The USB license key enforces the single concurrent user per license. Updates must be installed on each PC. The license is perpetual. Active maintenance subscription is required to receive updates.



### **SITE**

The software is installed on each user's PC. A single USB license key is provided with the maximum number of concurrent users encoded. Software can be installed on an unlimited number of PCs. The USB license key enforces the maximum number of concurrent users per license. Updates must be installed on each PC. This platform is intended for customers with multiple concurrent users. The license is perpetual. Active maintenance subscription is required to receive updates.



### **ONLINE**

The software is installed and runs on the exida exSILentia server. Users login to the server and use the software. A single access account per is provided per license. Updates are installed by exida. The license is subscription period based, e.g. 3, 6, or 12 months.



### **SERVER**

The software is installed and runs on a Citrix® XenApp server within a customer's IT environment. Users login to the server and use the software. Updates are installed by the customer's IT department. The license is perpetual. Active maintenance subscription is required to receive updates.



# Training & Support



exida has a variety of resources to get started with exSILentia v4. These include training classes organized by exida Academy on both the software tools, as well as the lifecycle background on which the tools are based. These courses can be delivered in person or on demand.

Additionally, there are a variety of resources is available from the exSILentia website ([www.exSILentia.com](http://www.exSILentia.com)) such as general information, white papers, and instructional videos. exSILentia v4 tool support is offered by means of a Frequently Asked Questions (FAQ) and Support Ticket website (<http://support.exida.com>).



## **exida offers exSILentia specific consulting services such as:**

- » PSM Process Gap Analysis (Evaluate your current practices, do they meet legal requirements?)
- » IEC 61511 Functional Safety Gap Assessments
- » Functional Safety Assessments per IEC 61511 (Independent review for Project Functional Safety Activities)
- » Development of work processes, e.g. PHAx to LOPAx criteria work process or Alarm Rationalization work process
- » Consulting / Task Facilitation

**For more information or to request a quote:**

Contact your local exida representative

**or visit our website at:**

*[www.exsientia.com](http://www.exsientia.com)*





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