SCADE System is the product line of the ANSYS® Embedded software family of products and solutions that empowers users with a systems design environment for use on systems with high dependability requirements, providing full support of industrial systems engineering processes, such as ARP 4754A, ISO 26262, and EN 50126.

This product features functional and architectural system modeling and verification in a SysML-based environment. SCADE System provides a strong foundation to deploy Model-Based Systems Engineering (MBSE) processes and best practices. A key feature is the capability to generate consistent and comprehensive Interface Control Documents (ICD) as an important outcome of the MBSE processes.

SCADE System has been specifically developed for system engineers; the underlying SysML™ technology is hidden making modeling more user-friendly and intuitive than standard SysML tools or plain databases. By using SCADE System in conjunction with SCADE Suite®, SCADE Display® and SCADE LifeCycle®, system and software engineers can work within the same framework. Developers can quickly synchronize between the system model and the software subsystem components, ensuring consistency and efficiency, for instance for the management of I/O definitions. Delivered with SCADE Suite, SCADE System® provides an integrated software engineering solution combining software architecture and software design in a single comprehensive user interface.

Read more about SCADE System:
- “System Requirements Analysis”
- “System Design”
- “System Design Verification”
- “ICD Generation and Synchronization with Software Design”
- “System Design Environment Configuration”
- “SCADE Tools Integration”
- “Standard-Based Solution”

System Requirements Analysis

SCADE System Advanced Modeler features the following capabilities:

**Analysis of System Use Cases**
- Representation of system use cases and actors interacting with the system in Use Case Diagrams
- Ability to refine use cases with Sequence, Activity, or State Machine Diagrams

**Analysis of System Scenario**
- Representation of operational system scenario in Sequence Diagrams
- Allows for links and navigation to actions in Activity Diagrams and states in State Machine Diagrams

**Analysis of System States**
- Representation of system states and transitions at any level of system decomposition in State Machine Diagrams
- Refinement of any state with referenced State Machine Diagrams
- Free text or signal usage on transitions

**Analysis of System Activity**
- Representation of the actions control flow within a subsystem at any level of system decomposition in Activity Diagrams
- Refinement of any action with referenced Activity or State Machine Diagrams
System Design

SCADE System Advanced Modeler features the following capabilities:

**Functional and Architecture Design**
- Functional and architecture decomposition through block diagrams
- Simple and intuitive definition of system architectures through the concept of reusable/unique blocks
- Component reuse managed with block replicas and ability to allocate items independently on each component replica
- Comprehensive visualization of component hierarchy within project tree
- Allocation of functions to components made locally to the functions or the components, or through drag & drop in allocation tables
- Annotations mechanism to add custom properties on model objects

**Data Management**
- Definition of data dictionaries
- Import/export of data dictionaries in Microsoft® Excel® or Comma-Separated Value files
- Data propagation across block hierarchy
- Data propagation path visualization
- Data propagation consistency checks
- Tables of model objects (Input/Output ports, connectors, data, allocations) with customizable columns aimed at quickly and efficiently managing long lists of data
- Capability to search in table contents

**Model-Based Design Solution**
- More user-friendly than plain databases
- Support of all standard drawing features such as alignment, line styles, fonts, etc.
- Styles management for better visual identification of components in diagrams
- Navigation capabilities within model content and definitions with Find and Browse

**Support of Collaborative Work**
- Extraction of system parts for third parties, ensuring IP protection of the system model
- Management of read-only model libraries and support for library re-organization allowing multi-user collaboration
- Multi-file persistence with customizable granularity for packages and blocks allowing fine grain Configuration Management
- Read/write access to SCADE System models through an OCL, TCL, or Java model API
- Capability to develop specific import/export through the model API

**Support for Requirements Traceability**
- Traceability to requirements available with SCADE LifeCycle ALM Gateway as detailed in “System Life Cycle Management”
System Design Verification

Model Consistency Checking
- Automatic verification of modeling rules applicable to entire model or model parts
- Set of predefined rules for common usage patterns, ability to quickly fix violated rules
- Live Checker mode for on-the-fly rule check
- Addition of custom rules through the API (in OCL, TCL, Java)
- Customizable verification configurations to be used for different parts of the model or at different stages of the design
- Report generation in RTF or HTML with direct hyperlinks on model elements to locate violations

ICD Generation and Synchronization with Software Design

Automated Production of Interface Control Documents (ICDs)
- Production of tables from propagated data representing interfaces of blocks
- Custom query columns (OCL, TCL, Java) allowing automated extraction of related information from the model, for example data producer and consumers, properties from the communication data path, etc.
- Import/export of table in Microsoft Excel and Comma-Separated Value files

Model Diff/Merge
- Analysis of differences between system model versions
- Filters for the display of model differences
- Merge capabilities to copy changes selectively or in bulk, or to ignore changes selectively
- User control on matching strategy applicable to Diff analysis
- Tree view of differences allowing for easy understanding of removals, insertions, and changes on SCADE System model objects
- Comprehensive report about merge actions and differences before and after merge sessions

For information on the SCADE Suite product line, see the SCADE Suite technical data sheet.
System Design Environment Configuration

SCADE System Configurator

SCADE System Configurator allows methods and tools engineers to configure SCADE System Advanced Editor to specific needs of a group of users. Domain-specific configuration relates to the use of industry standards like IMA and AUTOSAR, or to company or project standards.

SCADE System Configurator features the following capabilities:

• Definition of domain-specific objects derived from SCADE System design elements
• Definition of domain-specific objects, properties, and inter-objects constraints in simplified class diagram
• Customization of domain-specific modeler with dedicated user interface palettes, property pages, and menus
• Customization of graphical styles and tables from Configurator preview for immediate reuse in configured SCADE System
• Automatic generation of configuration plug-ins for deployment of domain-specific modelers
• Capability to apply predefined or custom rules on metamodels with SCADE System Checker

SCADE System Avionics Package

Comprehensive solution for designing embedded avionics system with respect to a clean separation of concerns into functional, software, and platform levels.

This package allows system engineers to handle ARINC 429, ARINC 664-P7/AFDX, or CAN communication protocols, Integrated Modular Avionics architecture, and ARINC 653 specific properties. Verification of AFDX communication bandwidth, and generation of ARINC 653 configuration files are automated. SCADE System Configurator is a prerequisite for using the Avionics Package.

For information on the package, see the SCADE System Avionics Package technical data sheet.

SCADE Tools Integration

System Life Cycle Management

The life cycle management of system design developed in SCADE System can be supported by SCADE LifeCycle:

• Connecting Application Lifecycle Management (ALM) tools and setting requirements traceability from models
• Generating documentation automatically from models

For information on the SCADE LifeCycle product line, see the SCADE LifeCycle technical data sheet.

Standard-Based Solution

SCADE System modeling relies on a subset of the SysML standard and compliance with the OMG XMI storage format.

1. Development done in partnership with CEA LIST within the LISTEREL Critical Software Laboratory.
Minimal/Required System Configuration

<table>
<thead>
<tr>
<th>OS Platforms</th>
<th>Microsoft® Windows 7 SP1 (64-bit)¹ or Windows 8.1 (64-bit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU processor</td>
<td>1.5 GHz or faster</td>
</tr>
<tr>
<td>RAM</td>
<td>1 GB minimum (2 GB recommended)</td>
</tr>
<tr>
<td>Disk Space</td>
<td>1 GB minimum</td>
</tr>
<tr>
<td>Protocol</td>
<td>Network adapter and TCP/IP installed and configured for license management</td>
</tr>
<tr>
<td>Display</td>
<td>16-bit color, 1280x1024 screen resolution recommended</td>
</tr>
</tbody>
</table>

1. SCADE System application is compiled on Windows 7 SP1 (32-bit). Tests performed on other platforms ensure all SCADE System modules support them.

SCADE System Product Line

SCADE System Advanced Modeler:
- Editor
- Diff/Merge
- Checker
- Model API
- Synchronizer with SCADE Suite
- Application Lifecycle Management Gateway
- User documentation and online help

SCADE System Configurator
- Graphical edition of configurations
- Configuration plug-in generation

SCADE System Avionics Package

SCADE LifeCycle Integration:
- SCADE LifeCycle Reporter

Contact Information

Submit questions to Technical Support at
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Contact one of our Sales representatives at
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Direct general questions about Esterel Technologies to
scade-info@esterel-technologies.com

Discover the latest news on our products and technology at
http://www.esterel-technologies.com

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