SCADE Display® 17.0

SCADE Display is the product line of the ANSYS® Embedded software family of products and solutions that empowers users with a versatile graphics design and development environment for embedded Human Machine Interfaces (HMI).

With a native support for the OpenGL® SC (Safety Critical) and ES (Embedded System) standards, SCADE Display represents a new generation of graphics software development tools, spanning prototyping, display design, simulation, verification and validation, and certified code generation supporting several safety standards in a certifiable environment.

SCADE Display is tightly integrated with SCADE Suite® providing a comprehensive development environment for both embedded HMIs and their behavioral logic.

Tailored for Critical Embedded HMIs

SCADE Display drastically reduces critical project costs by providing WYSIWYG design entry with automatic qualified code generation technology. SCADE Display KCG Code Generator is qualifiable as development tool under DO-178B level A, as DO-330 TQL-1 tool under DO-178C, and certified under ISO 26262:2011 at TCL3/ASIL D and C, IEC 61508:2010 at T3/SIL 3, and EN 50128:2011 at T3/SIL 3/4.

SCADE Display KCG Certification Kits provide all material required by the certification authorities:

- *Tool Qualification Plan* (TQP)
- *Tool Operational Requirements* (TOR)
- *Interface Requirement Specifications* (IRS)
- *Tool Accomplishment Summary* (TAS) or *Safety Case* (SC)
- *Compliance Analysis to certification standard*
- *Tool Installation Procedure* (TIP)
- *Tool Configuration Index* (TCI)
- and other standard-specific documents

More information in the technical data sheets on SCADE Display KCG Certification Kits.

Read more about SCADE Display:

- "Graphical Prototyping and Design"
- "Verification and Validation"
- "Automatic HMI Generation"
- "SCADE Tools Integration"
- "SCADE Solutions for ARINC 661 Compliant Systems"

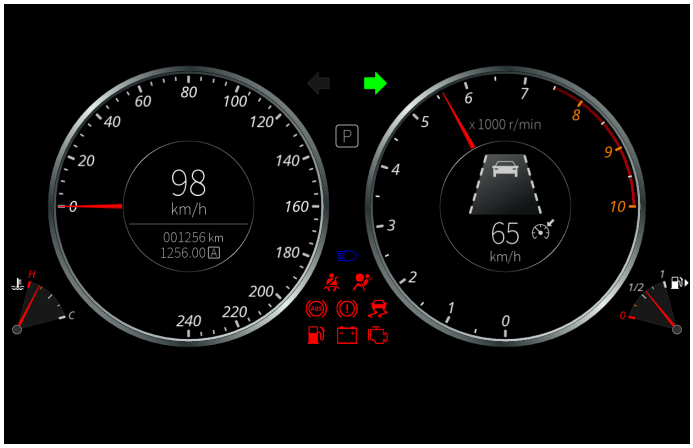
Graphical Prototyping and Design

Advanced Modeling

- User-friendly interface
- Rapid learning curve
- Standards-based: OpenGL, XML, PNG, JPEG, HTML
- Unified project structure across SCADE products for managing project files and resources
- Layering and tree structuring encourages creation, customization and reuse of specification parts as library objects
- Modular palette for access to all graphical primitives with preview of library objects
- Executable graphical specifications
- Advanced editing features: replication, undo/redo history, efficient search and replace, variables dictionary, plug expressions, live warning and error logs, etc.

High-Quality Editing

- Transparency management at graphical primitive level with real-time visualization
- Texture management: UV mapping, alpha textures control and color modulation
- Haloing, anti-aliasing, multiline text support
- Masks (clip lines/boxes, stencils) support
- Bitmap import/export
- Zoom and navigation manager



Streamlined Design of Interactive HMIs

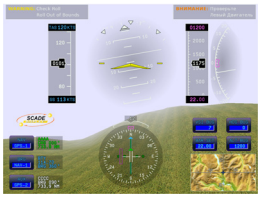
- Interactive HMI design creation with dedicated primitives for active areas, multiple pointing device (including touch screens) or keyboard events management
- Extensive library of widgets, including domain specific widgets (gauges, scales, roses, etc.), interactive HMI widgets (buttons, tabs, edit boxes, etc.), and next generation HMI capabilities (gesture recognition, graphical animations)

Integrated Font Management

- Editing of bitmap and stroke fonts
- TrueType®/OpenType® font import
- Built-in support of regional encodings
- XML font data storage format
- Generation of embeddable font source code either in pure-vector or textured formats

Smooth Integration within Existing Environments

- Combine, at model level, all external OpenGL 2D/3D graphics (legacy code, 3D terrain/maps, 3D objects) with SCADE Display layers
- Easy automatic migration of Presagis VAPS® and VAPS XT formats and ENSCO IData® models into SCADE Display executable specifications



Java-Based Eclipse Model API

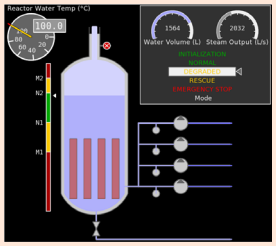
- Read/write access to SCADE Display project and model files in Java from Eclipse Modeling Framework (EMF)

Configuration Management

- Built-in integration with most Configuration Management Tools through SCADE Display Configuration Management Gateway

SCADE Display Sweet Spots

SCADE Display is used as an HMI display software prototyping and development tool by leading companies in the aerospace, rail transportation, automotive, nuclear, and industrial domains. It is ideally suited to support the design of critical embedded display systems (Multi-Function Displays, Head-Up Displays, Digital Instrumentation and Control Panels, etc.), but also to create schematics (electrical, hydraulic, or plant mimic diagrams), as well as 2D/3D simulator displays and trainers for drivers/pilots, crews, or maintenance teams training.



Support for Requirements Traceability

- Traceability to requirements available with SCADE LifeCycle® ALM Gateway as detailed in "Application Life Cycle Management"

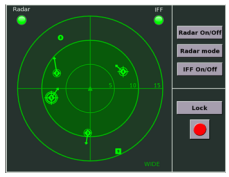
Verification and Validation

Interactive Simulation

- Simulation of graphical specifications in step-by-step or continuous mode
- Ability to load, play, and record scenarios and produce snapshots
- Batch mode available

Early Symbology Verification

- Rapid animation of the specification through a simple and intuitive GUI
- Built-in model animation laws (no need to write complex scenarios)



Automatic Design Checking

- Compliance of display specifications to methodology, naming and graphical design rules
- Automatic checks, suggestions, and corrections
- Batch campaigns enabled
- Optimization of executable specification performance
- Report all warnings and errors detected by checker verification (textual or CSV format)

Automatic HMI Generation

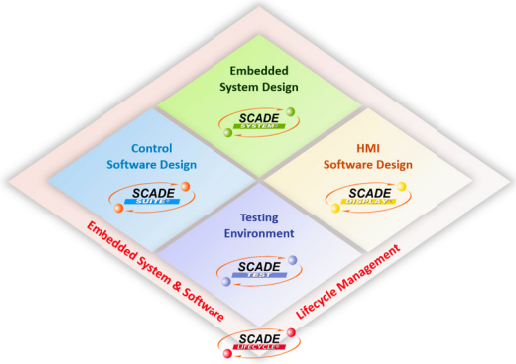
Automatic Code Generation

- Automatic generation of compact, efficient, modular, safe, and target independent C code
- Elimination of coding errors, as well as the need for low-level testing
- No run-time fee
- No program usage restriction
- Qualifiable/Certified SCADE Display KCG 6.4.3:
  - qualifiable as DO-330 TQL-1 tool under DO-178C
  - qualifiable as development tool under DO-178B
  - qualified under ISO 26262:2011 at ASIL D and C
  - certified under IEC 61508:2010 at SIL 3
  - certified under EN 50128:2011 at SIL 3/4
- SCADE Display KCG 6.6.2:
  - Rendering speed-up and smaller memory footprint
  - Static groups implemented either as textures, Display Lists on OpenGL SC targets, or as Frame Buffer Objects (FBO) on OpenGL ES2 targets

Code Integration and Deployment

- No dependency with target hardware or RTOS
- Native support of OpenGL, OpenGL SC 1.x (Safety Critical) and OpenGL ES 1.x and 2.x (Embedded System) standards via OpenGL eXtension (OGLX)
- Quick target deployment to virtually all target platforms (Windows, Apple iOS, and Android-based mobile devices, embedded target platforms, etc.)
- Automatic generation of HMI applications for Windows/PC, Apple iOS, or Android platforms

SCADE Tools Integration



Development of HMI Behavioral Logic

SCADE Display allows for the refinement of HMI software with behavioral logic in SCADE Suite model-based development and verification environment.

Design

- Tight design-level integration of critical behavioral logic and graphic components in embedded applications
- Automated connection between SCADE Suite and SCADE Display designs

Simulation

- Early prototyping and validation in white-box and black-box modes between display application logic and graphic components
- Co-execution of SCADE Suite model and interactive SCADE Display specification as run-time free standalone executables

Reporting

- Integration of automatic report generation between SCADE Suite models and SCADE Display graphical specifications

Code Generation

- Integrated deployment of SCADE Suite and SCADE Display generated code

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

Connectivity with System Simulation Tools

SCADE Display integrates seamlessly with ANSYS® Simplorer®, through the FMI/FMU co-simulation standard, to enable interactive E/E and multi-physics simulation sessions.

- Functional Mock-up Unit (FMU) export out of SCADE Display models for connection with ANSYS Simplorer and all FMI-compliant system simulation tools
- FMU proxy generation for distributed/network simulation with FMI-compliant tools
- Support for FMI 2.0 Model Exchange Export

Application Life Cycle Management

The life cycle management of HMI software developed in SCADE Display 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.

SCADE Solutions for ARINC 661 Compliant Systems

In the Aerospace domain, SCADE Solutions for ARINC 661 Compliant Systems address the needs of aircraft manufacturers and their suppliers for efficiently creating ARINC 661-compliant Cockpit Display Systems (CDS) and User Applications (UA) with the highest level of quality and safety.

For projects requiring certification, SCADE Solutions for ARINC 661-Compliant Systems enables a quick-start of embedded ARINC 661 projects with DO-178B or DO-178C.

The solutions are built on top of SCADE Suite for developing User Applications (UA) and widget logic, and on top of SCADE Display for UA Definition Files and widget graphics. The following modules for ARINC 661 compliant systems can be acquired independently:

- SCADE Widget Creator
- SCADE Widgets Library
- SCADE UA Page Creator
- SCADE UA Definition File Generator
- SCADE Server Creator

For more information, see the SCADE Solutions for ARINC 661 Compliant Systems technical data sheet.

Minimal/Required System Configuration

OS Platforms [1]	Microsoft® **Windows 7** SP1 (64-bit)[2] or **Windows 8.1** (64-bit)
CPU processor	1,5 GHz or faster
RAM	1 GB minimum (2 GB recommended)
Disk Space	1 GB minimum
Protocol	Network adapter and TCP/IP installed and configured for license management
Display	16-bit color, 1280x1024 screen resolution recommended

1. SCADE Display KCG 6.4.3 Code Generator is qualifiable on Windows XP Professional SP3 (32-bit) and Windows 7 SP1 (64-bit) platforms.
2. SCADE Display application is compiled on Windows 7 SP1 (32-bit). Tests performed on other platforms ensure all SCADE Display modules support them.

SCADE Display Product Line

SCADE Display Advanced Modeler Seat:
- Editor
- Design Checker
- Simulator
- Animator
- Configuration Management Gateway
- Application Lifecycle Management Gateway
- SCADE Suite Integration
- User documentation and online help

SCADE Display KCG Code Generator (with OGLX extension)

SCADE Display KCG Certification Kits:
- SCADE Display KCG 6.4.3 DO-178B&C Levels A and B Certification Kit
- SCADE Display KCG 6.4.3 IEC 61508 SIL 3 Certification Kit
- SCADE Display KCG 6.4.3 EN 50128 SIL 3/4 Certification Kit
- SCADE Display KCG 6.4.3 ISO 26262 Certification Kit

SCADE LifeCycle Integration:
- SCADE LifeCycle Reporter

Contact Information

Submit questions to Technical Support at
scade-support@esterel-technologies.com

Contact one of our Sales representatives at
scade-sales@esterel-technologies.com

Direct general questions about Esterel Technologies to
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Discover the latest news on our products and technology at
http://www.esterel-technologies.com