# Ansys SCADE Test

SCADE Test is part of the Ansys Embedded Software family of products and solutions. It provides engineers with a complete testing environment for requirements validation and test case creation and management. It also lets you automate test case execution both on host and on target, measure coverage, and manage test results for any SCADE application.

/ Best-In-Class Technology

Test creation and maintenance, together with test execution and coverage analysis, are time-consuming activities. SCADE Test for Verification and Validation (V&V) activities provides best-in-class technology in both a model-based approach and a cost-effective testing environment, allowing you to significantly reduce testing efforts.
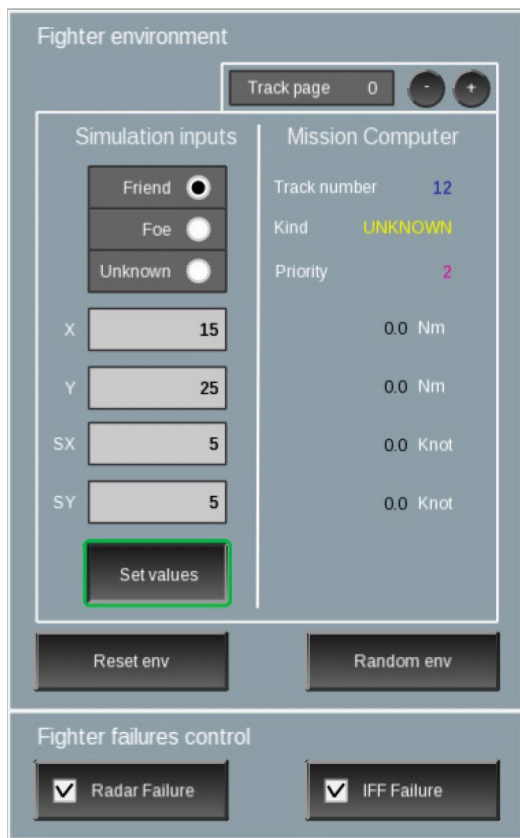
/ Requirements for Validation and Test Creation

SCADE Test Rapid Prototyper enables you to create interactive panels using predefined widgets (buttons, sliders, etc.) to interact with the application under test. It empowers model simulation, including connections with SCADE Suite®, SCADE Display®, Ansys Twin Builder® and many other tools. Early requirements validation is made possible through a variety of features:

- Graphical panel design from a library of predefined widgets (controls and indicators) including next generation human-machine interface (HMI) concepts (gesture recognition, graphical animation).

- Interactive graphical panels for debug and simulation sessions.

- Extensible library and customizable widgets.

- Unified project structure across SCADE products for managing project files and resources.

- Ease of resource table management (color, line/width stipple, texture, font, symbol, picture).

- Variables dictionary management.

- Automatic generation of executable applications for Windows/PC, Apple iOS or Android platforms at no run-time fee.

- Integration with SCADE Suite model-based development environment, Ansys Twin Builder and other FMI-compliant tools.

- FMU proxy generation for distributed/network simulation in FMI compliant tools.

SCADE Test Environment for Host provides an interactive and a batch user interface for applications developed in SCADE Suite and SCADE Display. From the interactive interface, test engineers can create and manage test data, set up and launch test execution, and finally, obtain summarized and detailed test execution reports. SCADE Test Environment for Host features:

- Test scenario recording.

- Interactive management of test data within Test Projects.

- Interactive analysis of test results within Test Results Projects.

- Readability of test cases for efficient reviews.

- Tabular (only for SCADE Suite) or textual format.

- Test case template generation and Microsoft® Excel® gateway (only for SCADE Suite).

- Powerful checking capacity of expected results:

- Invariant checking.

- Accuracy tolerance customization by data or group of data.

- Definition of test cases independent from model implementation.

- Table of aliases to associate logical names to implementation names. Table is reusable for all test cases.

- Modularity allowing reuse and factorization (initialization sequence) easy maintenance of test data.

- Test API enabling System in the loop Software Testing.

Host Execution and Model Coverage

SCADE Test Environment for Host enables early testing at SCADE Suite or SCADE Display model level. Tests developed at model level can be automatically executed on host relying on C or Ada code. SCADE Test Environment for Host supports the verification of:

- Compliance to high-level software requirements.

- Accuracy and consistency of the model.

- Algorithm aspects.

- Robustness aspects.

- Rendering.

At test execution, SCADE Test Environment for Host automatically produces a test conformance report comparing actual results and expected results on host. This report includes a summary for quickly checking test status (Passed or Failed) along with further details to localize and understand issues.

SCADE Test Environment for Host has been qualified as for DO-178C/DO-330 at TQL-5, ISO 26262 TCL3, EN 50128 T2, IEC 61508 T2. SCADE Test Environment for Host certification data includes Tool Operational Requirements (TOR), Tool Configuration Index (TCI), and Release Note (RN). Other data are available to auditors for audit in Ansys premises upon request.

SCADE Test Model Coverage is a tool enabling model coverage measurement and analysis when running requirement-based Test Cases. SCADE Test Model Coverage can be used for control software applications designed with SCADE Suite with the capability to ensure the implication of the model level coverage to the generated code level.

SCADE Test Model Coverage tracks successful execution paths and percentages of each SCADE Suite function and operator that have been tested and enables Branch, DC and MC/DC coverage criteria at the SCADE Suite model level and at the generated code level.

SCADE Test Model Coverage also applies to embedded HMI applications design with SCADE Display, enabling Branch, DC and MC/DC coverage criteria of the SCADE Display model and at the generated code level.

Model-level coverage measures the following criteria:

• Branch Coverage (Influence)

• Decision Coverage (DC).

• Modified Condition/Decision Coverage (MC/DC).

SCADE Test Model Coverage has been qualified for DO-178C/DO-330 at TQL-4, ISO 26262 TCL3, EN 50128 T2, IEC 61508 T2. SCADE Test Model Coverage certification data includes Tool Qualification Plan (TQP), Tool Operational Requirements (TOR), Tool Configuration Index (TCI), and Release Note (RN).
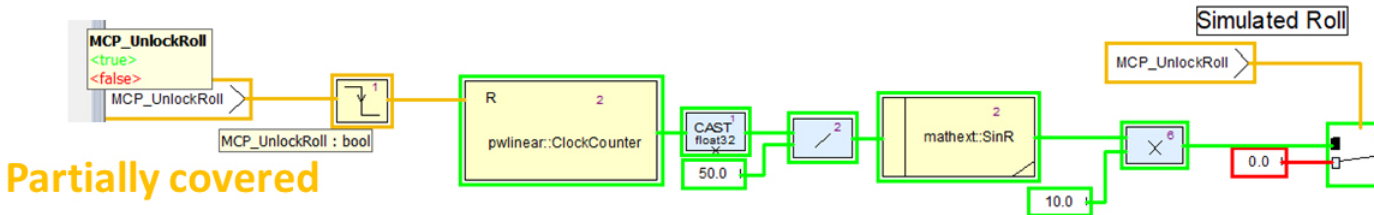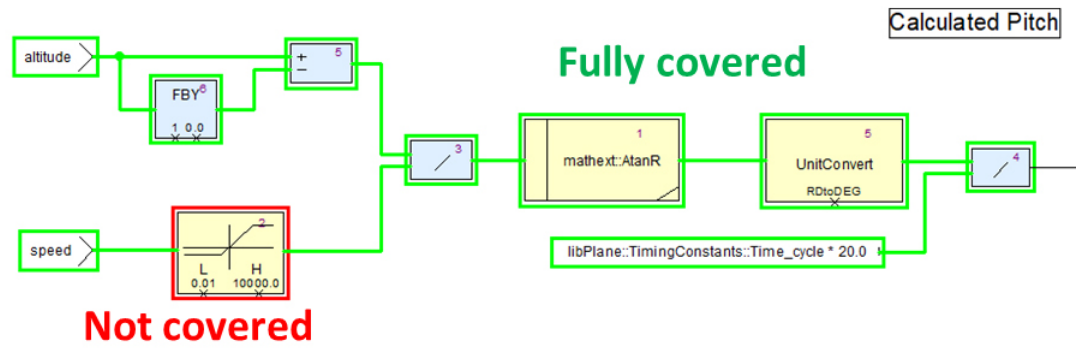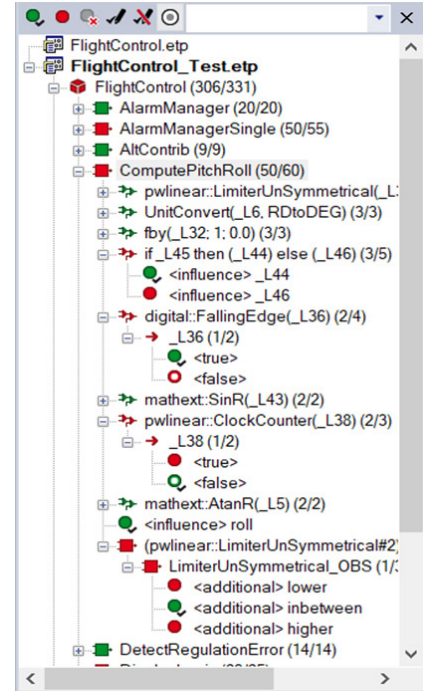
Target Execution

SCADE Test Target Execution automates the generation of target test harness for COTS tools (IBM Rational® Test RealTime, LDRA TestBed®, Vector Software VectorCAST™). It supports applications developed with SCADE Suite. SCADE Test Target Execution translates model test cases into test harnesses. Harness generation is customizable for integration in any in-house or COTS target test infrastructure.

SCADE Test Target Execution has been qualified for DO-178C/DO-330 at TQL-5, ISO 26262 TCL3, EN 50128 T2, IEC 61508 T2.

Application Lifecycle Management

The life cycle management of applications tested in SCADE Test are supported in SCADE LifeCycle® by:

• Connecting Application Lifecycle Management (ALM) tools and setting requirements traceability from testing models.

• Generating documentation automatically from testing models.

• Accessing Read/Write Test data from Product Lifecycle Management/Application Lifecycle Management (PLM/ALM) tools through a Tcl, Python and Java API.

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

/ SCADE Test Product Line

SCADE Test Environment for Host

- Test Environment for Host

- Rapid Prototyper

- Application Lifecycle Management Gateway

- Test Services API

SCADE Test Target Execution

- Target Execution for RTRT

- Target Execution for LDRA

- Target Execution for VectorCAST

- Target Execution for Generic Target

SCADE Test Model Coverage