VectorCAST

Operates in Host or Real-Time Embedded Environments

> Identifies Tested and Untested Source

> Supports Statement, Branch, and MC/DC Coverage Reporting

> Shows Aggregate Coverage Across any Subset of Test Cases

> Includes Code Complexity Metrics

> Supports Windows, Unix, and Linux Host Platforms

> Supports Development, Integration, and System Testing

> Computes Basis Path Information for Test Case Building

> Compiler and RTOS Independent

> Identifies Tested and Untested Basis Paths

Product Features:

> Easy-to-use GUI

> Command Line allows execution from scripts for regression testing

> Identifies redundant test cases and untested code

> Supports structural testing for DO-178B flight software

> Basis Path analysis report provides blueprint for test-case generation and path coverage

> Coverage instrumentation can be optimized for size or speed

> Coverage data can be buffered in memory or dumped in real time

> Supports coverage on source files of different languages in the same executable

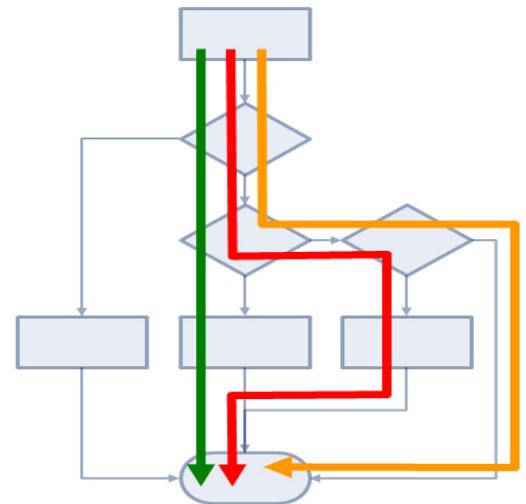# VectorCAST/Cover™
Code Coverage for Embedded Development
Supports C, C++, and Ada

What is VectorCAST/Cover

VectorCAST/Cover allows you to gauge the effectiveness of your test efforts by identifying which areas of an application were exercised during a test run. VectorCAST/Cover provides a convenient way to analyze the completeness of your system tests, ensuring that applications are not released with untested code. VectorCAST/Cover allows you to analyze any portion of your application, or the entire application at once. For each file that is analyzed, VectorCAST/Cover creates a multi-tabbed source-viewer widget containing the following information:

> Coverage Summary provides a color-coded view of your source code that identifies code that is completely covered, partially covered, or uncovered

> Metrics Summary provides a tabular list of code complexity and currently achieved source-code coverage for each subprogram

> Basis Path Analysis shows all control paths for each subprogram

> Modified Condition/Decision Coverage (MC/DC) for the RTCA DO-178B standard for Level A flight software


```
...
...
...
if( powerOn ) {
    if( temp > 80 )
        InitializeAC;
    else if(  temp < 60 )
        InitializeHeat;
    } else {
    DisplayMessage;
}
...
...
...
```

Source-Based Indication of Covered and Uncovered Paths

VECTOR
software

Code Complexity

VectorCAST/Cover supports the McCabe Cyclomatic Complexity Metric. This complexity metric can be used as a programming and management guideline to identify subprograms that may cause testing and maintenance problems. By reducing code complexity fewer test cases are required for exercising the subprogram.
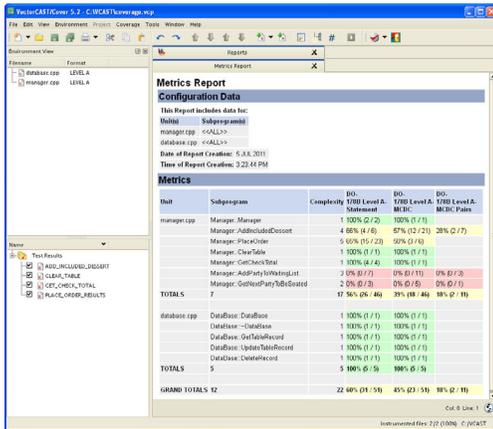
Metrics report shows code-coverage data summarized by project, file, and subprogram.

Basis Path Analysis

The Basis Path analysis tool identifies the number of test paths through each subprogram. The number of basis paths reflects the code complexity, which in turn corresponds to the number of test cases that must be run to completely exercise the subprogram.

MC/DC analysis provides the equivalence-pair matrices necessary for DO-178B Level A.

MC/DC Analysis

MC/DC analysis shows that each sub-condition can independently affect the outcome of the entire condition. To prove this you must be able to capture the values of the result of the condition as well as the value of each sub-condition. VectorCAST/Cover captures this information in two formats: an annotated source listing, and the equivalence pair matrices for each boolean condition.

Other VectorCAST Tools

VectorCAST/Cover is one of several tools in the VectorCAST family that supports software testing. VectorCAST/Ada and

VectorCAST/C++ provide full unit and integration testing capabilities, including stub and driver generation, test-case generation, test execution, and code coverage.

The coverage data generated by VectorCAST/Cover during system-requirements-based testing can be shared with VectorCAST/C++ and VectorCAST/Ada. This sharing allows 100% coverage to be achieved with a combination of system, unit, and integration testing.

Command Line Interface

VectorCAST/Cover provides a command-line utility to allow scripting of full functionality.

Static Analysis

In addition to providing support for cyclomatic complexity and basis path analysis, VectorCAST/Cover works with market leading source code static analysis technologies. These tools analyze source for compliance to pre-defined coding standards (such as MISRA C/C++) and check your C/C++ source code for bugs, inconsistencies, and non-portable constructs.

Embedded Target Support

VectorCAST/Cover supports testing on a variety of embedded target architectures. Whether you are using an industry standard such as INTEGRITY® or VxWorks®, a custom kernel, or a bare board, VectorCAST/Cover is the solution for embedded target-code coverage.

Coverage Reports

VectorCAST/Cover generates report output that can be viewed with the integrated code-coverage browser, or extracted to files for inclusion in project documentation. Report information includes the code covered, a basis-path analysis, and code-complexity metrics.
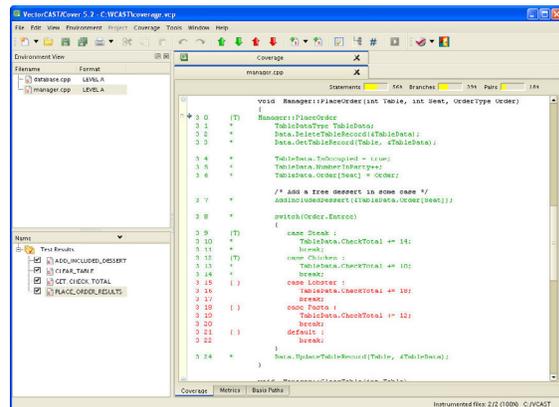
The Coverage Browser provides a graphical source-code view of tested and untested code.