

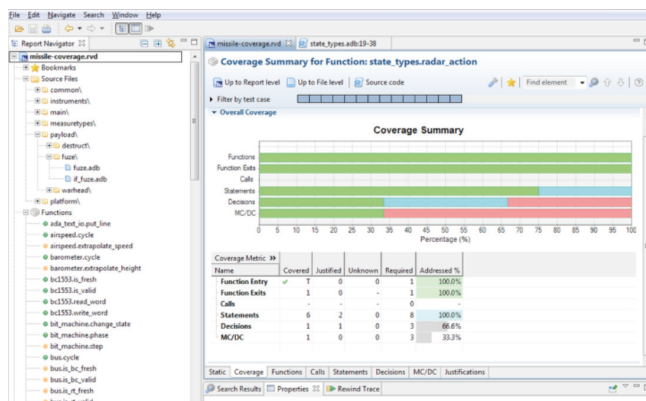
# On-target structural code coverage analysis with RapiCover

## RapiCover

### How can RapiCover help you?

RapiCover is an advanced tool for performing structural code coverage analysis, designed specifically to work with embedded targets and to satisfy certification requirements. RapiCover supports all coverage metrics required by DO-178B/C and ISO 26262:

- Function coverage
- Statement coverage
- Decision coverage
- MC/DC (modified condition/decision coverage)



### Benefits of using RapiCover

RapiCover, the most advanced structural code coverage tool, will help you reduce the effort and time you need to perform structural code coverage analysis.

RapiCover has been designed to improve the coverage analysis processes in the most complex and challenging embedded targets. By using RapiCover you can:

- Complete coverage analysis in fewer test cycles.
- Reduce instrumentation overhead by up to 90% compared to other tools.
- Seamlessly integrate code coverage analysis with your system and build process.

- Reduce your reporting effort by being able to:
  - Combine multiple reports.
  - Merge coverage from different runs and builds.
  - Merge coverage from unit and system level tests.
  - Merge coverage from partial instrumentations and tests.
  - “Justify” untested code (coverage holes) and migrate justifications across builds.
- Reduce your certification effort with our tool qualification kits.

### RapiCover use cases

- Identify code uncovered by test requirements.
- Identify test requirements missing for full coverage of your code base.
- Structural code coverage analysis to meet DO-178B/C objectives.
- Structural code coverage analysis to meet ISO 26262 requirements.

### How does RapiCover work?

RapiCover analyzes your source code to determine the optimal positions to apply instrumentation for coverage analysis. Integration with RapiCover includes a strategy for efficient collection of map data during your build process. RapiCover uses the map data obtained when you run your code, either on-host or on-target, to generate a coverage report you can view to see the coverage you obtained.

RapiCover’s instrumentation process can be customized to suit your coverage analysis needs. Whether you need to perform incremental coverage, instrument “literal” or “traditional” MC/DC decisions or analyze coverage on multi-core architectures, RapiCover is the tool you need.

# Key features of RapiCover

## Code coverage analysis

- On-host and on-target structural code coverage analysis
- Statement, function, decision and MC/DC coverage
- Coverage of complex code structures, including:
  - Ada elaboration code and case statements
  - C bitwise operators and assignment operators
  - Non-returning calls
- Fully configurable analysis:
  - Include or exclude specified modules/functions/directories from analysis
  - Apply different coverage metrics for each function
  - CAST-10 “literal” or “traditional” decisions
  - Masking or unique case MC/DC
- Supports a very large number of conditions in a decision

## Language support

- Ada 83, 95, 2005 and 2012, support for compilers including GNAT Pro and Green Hills
- C and C++, support for compilers including VisualStudio, GCC, Diab and TASKING
- Assembly code insertions
- Mixed language source code

## Build integration

- Multiple strategies available:
  - Compiler wrappers
  - Clone integration
  - Scripting into build system directly
- Support for very large code bases
- Split instrumentation between build cycles
- Shared integration with other RVS tools
- Build ID support

## Target integration

- Support for data collection using CAN, Serial, Ethernet, debuggers and our own **RTBx** data logger
- Extremely low overhead map data collection can be configured with a single assembly instruction
- No library/run-time dependencies or dynamic memory requirements
- Extremely efficient MC/DC target library
- Collect and report coverage on a per-test basis

- Incremental coverage
- Coverage analysis across power cycles (subject to hardware requirements)
- Freeze and reset coverage collection to eliminate accidental coverage

## Justifications

- Assign justifications to explain missing coverage
- Merge justifications from different builds
- Automatic and manual relocation of justifications
- Import justifications from and export to third-party tools
- Multi-user editing support

## Tool qualification

- High-quality kit to support DO-178B/C and ISO 26262 tool qualification
- Justification feature fully qualifiable out of the box

## Third party integration

- Tools such as Mx-Suite™, MATLAB Simulink and GNAT GPS
- Continuous build servers e.g. Jenkins, Bamboo
- Debuggers e.g. Lauterbach, iSYSTEM

## GUI

- Summary and detailed views
- Code viewer:
  - View source code alongside pre-processed and instrumented code
  - Color-coded by analysis type and whether code is covered, uncovered or justified
  - View missing coverage up to the condition level
- Merge coverage from different test runs, builds and strategies
- Compare reports
- Suggest missing test vectors for MC/DC coverage
- Database-like search function

## Licensing

- Enterprise License gives you access to new versions, support and maintenance
- One-year support and maintenance included in purchase price
- Single price for all features
- Licenses transferrable across projects



**Rapita Systems Inc.**  
41131 Vincenti Ct.  
Novi, MI 48375

Tel (USA):  
**+1 248-957-9801**

**Rapita Systems Ltd.**  
Atlas House, Osbaldwick Link Road  
York, YO10 3JB  
Registered in England & Wales: 5011090

Tel (UK/International):  
**+44 (0)1904 413945**