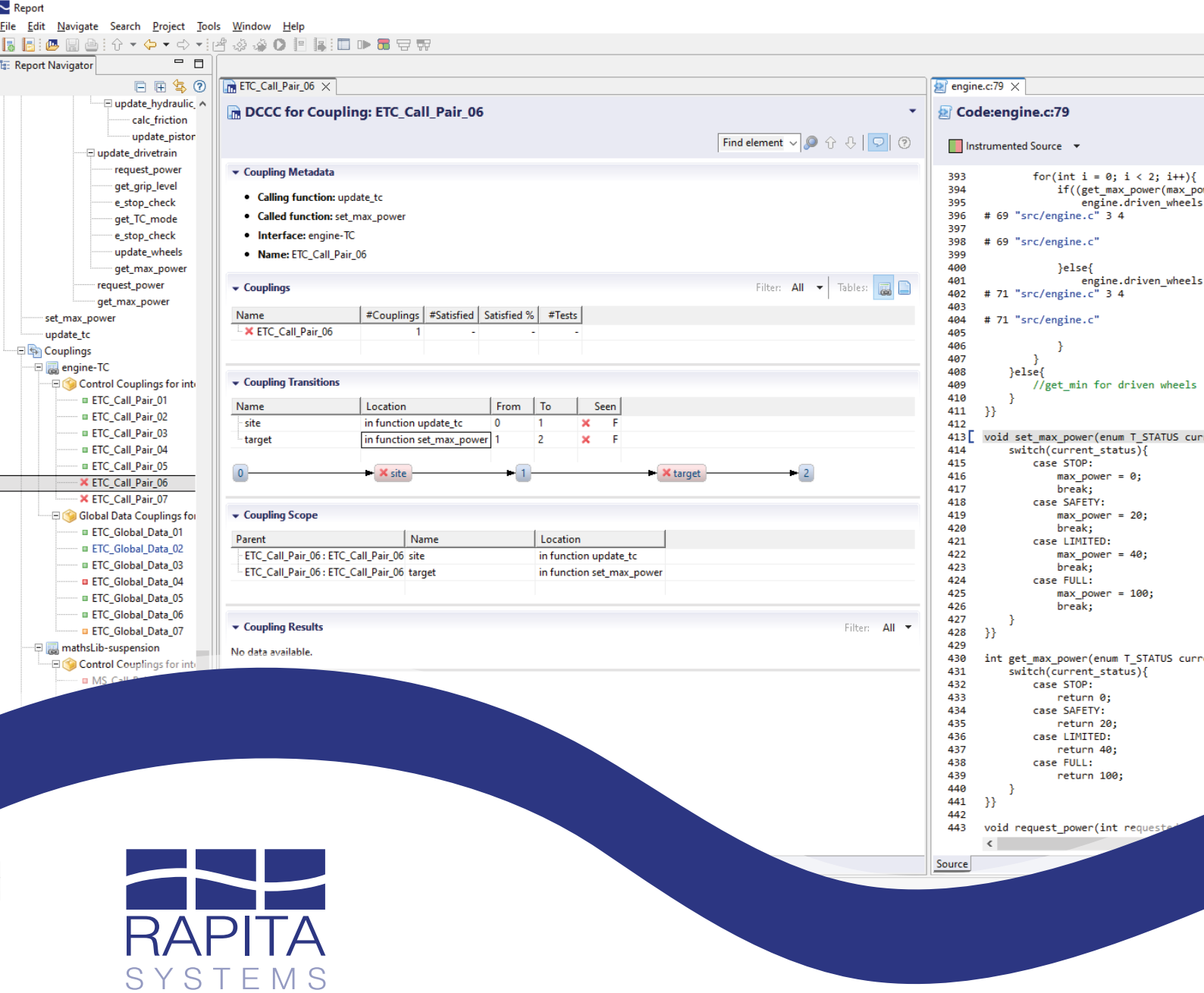


RAPITA SYSTEMS
A DANLAW COMPANY

Safety through quality

PRODUCT PREVIEW

RapiCoupling

Data Coupling and Control Coupling Analysis with Rapi**Coupling**

Product preview: Rapi**Coupling**

RapiCoupling

How can Rapi**Coupling** help you?

Rapi**Coupling** provides an automated framework to support Data Coupling and Control Coupling (DCCC) analysis for DO-178C and ISO 26262. It supports a wide range of coupling types and allows flexible definition of analysis goals.

Benefits of using Rapi**Coupling**

Rapi**Coupling** helps support the development of reliable software by providing a flexible, automated approach to data coupling and control coupling analysis. By using Rapi**Coupling**, you can:

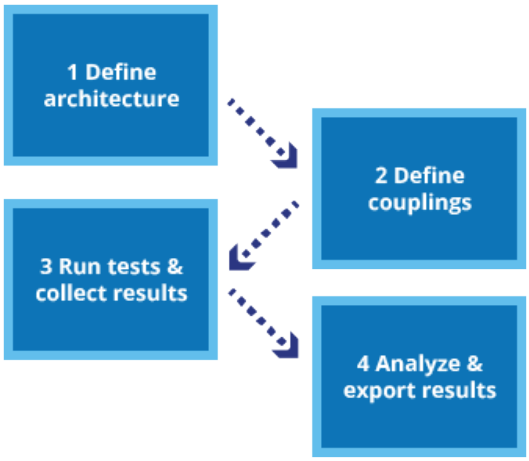
- Automate instrumentation and observation to provide DCCC analysis evidence using a qualified workflow.
- Configure DCCC analysis to meet your project's needs.
- Seamlessly integrate DCCC analysis into your existing development environment.
- Trace between tests, code and DCCC goals.
- Reduce your reporting effort by being able to:
  - Merge DCCC coverage from different runs and builds, even when they have different instrumentation.
  - View the progress of your testing over time through continuous build servers such as Jenkins.

Rapi**Coupling** use cases

- DCCC analysis to meet DO-178B/C objectives.
- DCCC analysis to contribute to AC 20-193 / AMC 20-193 objective MCP_Software_2.
- Data flow and control flow analysis to meet ISO 26262 guidelines.
- Generate evidence that interactions between software components have been exercised sufficiently in testing.
- Provide assurance that software interface requirements are met by your code.
- Diagnose missing DCCC coverage to improve the quality of your requirements, tests and code.

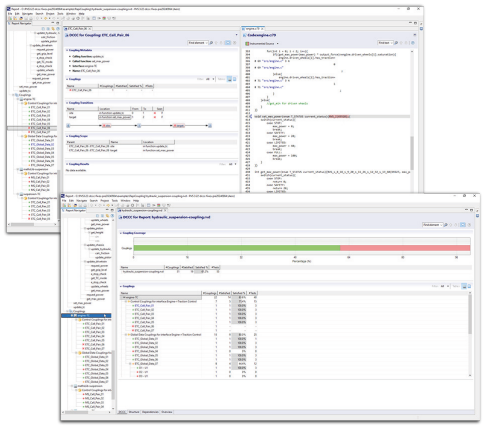
How does Rapi**Coupling** work?

Rapi**Coupling** provides a powerful framework to help you define couplings automatically, refine them manually, and automatically collect and report results.



This involves the following process:

1. First, the software architecture is defined by identifying the components and interfaces between them (as implied by DO-178C objective 6.4.4.d). Fast automated extraction of the architecture is available when the code structure permits.
2. Next, couplings (coverage and other DCCC goals) are created. Couplings can be generated automatically from the code and architecture, or added manually/ programmatically. Rapi**Coupling**'s flexible coupling definition approach allows you express a rich variety of properties you wish to observe in testing.
3. Rapi**Coupling** applies instrumentation to the code, so when tests are run, results are collected and a report is generated.
4. Summary and detailed report views help you identify and diagnose missing couplings, and exports support using Rapi**Coupling** to provide certification evidence.



This is a "Product Preview" with preliminary information about a product on our roadmap. To ensure that we can deliver the best product to meet your needs, we invite your feedback on requirements, design and evaluation – contact us to be involved.

Key features

The features listed below are features expected for the first public version of Rapi**Coupling**. We have plans to develop the product further when the first version has been released. For information on our long-term roadmap and to get involved, contact Rapita at info@rapitasystems.com.

DCCC analysis

- Automated instrumentation and observation for software Data Coupling and Control Coupling
- Analyze Data Coupling and Control Coupling structural coverage
- Analyze interface constraints derived from your architecture
  - Check that constraints are observed and not violated
  - e.g. data constraints (range, relationship), call sequencing constraints
- Generate common couplings automatically by static analysis
  - Call-return couplings
  - Definition-use data couplings (parameters)
  - Definition-use data couplings (global variables)
- Create couplings manually
- Configurable analysis to create DCCC criteria that are right for your project
- Architecture-led coupling definition
  - Define components to match your system architecture with automation assistance (files, folders, functions)
  - Create interfaces to capture the nature of interactions, with automation assistance
  - Generate couplings from interfaces between components by static analysis, link manually created couplings to interfaces
- Visualize source code architecture and dependencies
- Traceability
  - Identify relationships between source code and architecture
  - Add links to trace artifacts to couplings
- See how each test run or set of tests contributed to observed results
- Diagnose missing coverage
- Merge results from different integration builds and test runs

Language support

- C, compilers including Visual Studio®, GCCTM, Diab® and TASKING®

Build integration

- Multiple strategies available:
  - Compiler wrappers
  - Clone integration
  - Scripting into build system directly
- Support for very large code bases
- Split instrumentation between builds

Target integration

- Support for data collection using CAN, Serial, Ethernet, debuggers and our **RTB**x data logger
- Low overhead data collection
- No dynamic memory requirements
- Collect and report results on a per-test basis
- Analysis across power cycles (subject to hardware requirements)

Tool qualification

- Qualification kit and service to support DO-178C tool qualification
- Qualified instrumenter

Third party integration

- Continuous build servers e.g. Jenkins®, Atlassian Bamboo®

Integrated testing environment

- Summary and detailed results views
- Filter results on interface, test case, & coupling observed, unobserved or violated
- Coupling Navigator to easily navigate couplings
- Code viewer:
  - View original source code, pre-processed and instrumented code
- Compare reports
- Database-like search function
- Multi-user testing environment

Compatibility

- Runs on host operating systems
  - Windows® 10+ and Windows Server® 2016+
  - Linux® distributions including Ubuntu®
- Results can be collected from systems without supported operating systems and transferred to a supported system for analysis

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 transferable across projects

RAPITA Systems
A BAE Systems Company

About Rapita

Rapita Systems provides on-target software verification tools and services globally to the embedded aerospace and automotive electronics industries.

Our solutions help to increase software quality, deliver evidence to meet safety and certification objectives and reduce costs.

Find out more

A range of free high-quality materials are available at:
rapitasystems.com/downloads

SUPPORTING CUSTOMERS WITH:

Tools	Engineering Services	Multicore verification
Rapita **Verification Suite**:	V&V Services	**MACH**[178]
Rapi**Test**	Integration Services	Multicore Timing Solution
Rapi**Cover**	Qualification	
Rapi**Time**	SW/HW Engineering	
Rapi**Task**	Compiler Verification	

Contact

Rapita Systems Ltd.
Atlas House
York, YO10 3JB
UK
+44 (0)1904 413945

Rapita Systems, Inc.
41131 Vincenti Ct.
Novi, Mi, 48375
USA
+1 248-957-9801

Rapita Systems S.L.
Parc UPC, Edificio K2M
c/ Jordi Girona, 1-3
Barcelona 08034
Spain
+34 93 351 02 05

rapitasystems.com

linkedin.com/company/rapita-systems

info@rapitasystems.com