

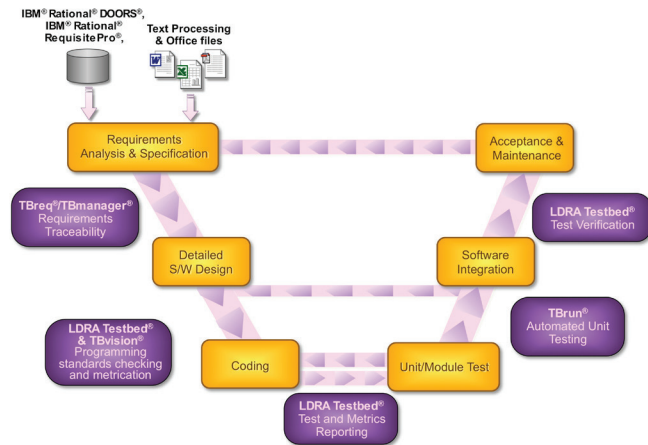
TBreq®/TBmanager®

Collaborative, Requirements-Based Development and Verification

The key to collaborative development and verification is the co-ordinated sharing of requirements artifacts across a wide range of project activities and stakeholders, as supported by *TBreq/TBmanager* (patent-pending). The artifacts include High-Level, Low-Level, and Derived requirements organized into a Requirements Traceability Matrix (RTM) and coupled to Verification Tasks, Verification Plans and Reports, as well as non-conformance (defect) reports. Activities include development, testing, code coverage generation, software quality analysis and project reviews. Verification Tasks define and automate the verification process and link directly with LDRA Quality Models, the tried and tested technology developed over the past 40 years to meet industry standards such as DO-178B/C, IEC 61508, IEC 62304, EN 50128, MISRA, CERT C, ISO 26262 and JSF++ AV.

Requirement Traceability and Verification

Requirements can come from many sources: Requirements Management tools such as IBM® Rational® DOORS®, IBM® Rational® RequisitePro®, Microsoft® Word or Adobe® PDF documents, Microsoft® Excel spreadsheets, in-house developed tools or bug tracking systems. *TBreq/TBmanager* also supports the collaborative definition of Low Level and Derived requirements and their incorporation into the automated Requirements Traceability Matrix maintained by *TBreq/TBmanager*.



Why worry about requirements-based development and verification?

It is mandatory for CMMI level 2 and above, and for certification in the Avionics, Defense, Railway Transportation, Automotive, Nuclear Power and Medical industries. These best practices are also being adopted by telecommunication companies, computer and appliance manufacturers, as well as other leading edge industry suppliers.

TBreq/TBmanager, through its integration with the *LDRA tool suite*, is a unique solution that can help your team overcome the challenges of allocating requirements to team members, mapping requirements to design and source code, linking test cases to requirements and automatically generating verification reports. Activity results, including defect reports, are automatically returned to the requirements management tool and/or defect tracking tool via *TBreq/TBmanager* to provide round-trip requirements verification.

Compliance with your Certification Standards

Qualification represents the agreement from Certification Authorities to reduce or replace manual activities with tool results and verifications.

TBreq/TBmanager complies with the most demanding quality standards: CMMI, DO-178B/C for Avionics, EN 50128 for Railway transportation and IEC 61508 for Automotive to name a few. The tool is compliant with the Airbus process for A380 & A340 projects, Boeing 787, F-35 Lightning II, NASA CEV and other major projects.

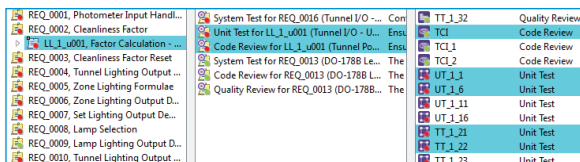
TBreq/TBmanager is qualifiable according to all of these standards and LDRA can assist in this qualification process. LDRA also offers a DO-178B/C Tool Qualification Support Pack to enable the certification process.

All of these features combine to make *TBreq/TBmanager* the most effective solution for collaborative requirements-based development and verification on the market today.

TBreq®/TBmanager® - Automating Requirements Traceability & Verification

Manage changing requirements and testing

Requirements are an essential building block of a project and hence managing their change over time and their verification prior to product delivery is critical. *TBreq/TBmanager* provides a straightforward and easily configurable interface to your requirements management environment. Allocated requirements and verification artifacts are made visible across your development team. All test results are recorded and deviations may be used to manage change to affected artifacts. The impact of any change is highlighted across the whole project so that all team members can identify “suspect” data and check for regression.



REQ_0001, Photometer Input Handl...	System Test for REQ_0016 (Tunnel I/O ...	TT_1_32	Quality Review
REQ_0002, Cleanliness Factor	Unit Test for LL_1_0003 (Tunnel I/O ...	TCL1	Code Review
LL_1_0001, Factor Calculation ...	Code Review for LL_1_0001 (Tunnel Po...	TCL1	Code Review
REQ_0003, Cleanliness Factor Reset	System Test for REQ_0013 (DO-1788 L...	TCL2	Code Review
REQ_0004, Tunnel Lighting Output ...	Code Review for REQ_0013 (DO-1788 L...	UT_1_1	Unit Test
REQ_0005, Zone Lighting Formulae	Quality Review for REQ_0013 (DO-1788...	UT_1_6	Unit Test
REQ_0006, Zone Lighting Output D...		UT_1_11	Unit Test
REQ_0007, Set Lighting Output De...		UT_1_16	Unit Test
REQ_0008, Lamp Selection		TT_1_21	Unit Test
REQ_0009, Lamp Lighting Output D...		TT_1_22	Unit Test
REQ_0010, Tunnel Lighting Output ...		TT_1_23	Unit Test

Traceability Matrix created automatically

TBreq/TBmanager is unique in providing end-to-end, graphical traceability reports in a single view. Analysts and project managers can see a complete picture of traceability from software requirements to design, code, test specifications and test results. All reports are exportable to Microsoft Office documents and easily customised to meet project needs.

Comprehensive verification tracking

The ability to define and manage analysis, implementation and test verification tasks within *TBreq/TBmanager* is an ideal solution for automating what has been historically a manual verification process. *TBreq/TBmanager* enables organisations to create links from requirements to analysis and test activities so you can:

- Define analysis scenarios, such as automated code reviews and link them back to the original requirements
- Instigate test runs and record test run results with the associated code coverage measurements
- Automate defect logs and generate non-conformance documentation
- Interrogate requirements for requirements coverage and test status

Key Benefits

TBreq/TBmanager provides the features required by Quality and Certification standards for multi-level and bi-directional requirements traceability and impact analysis:

- Integration with the most popular third-party Requirements Management tools to increase requirements visibility and to drive traceability throughout your design, coding and testing
- Requirement testing traceability matrix generation
Automated generation of test verification plans and reports
- Automatic test case generation from source code
- Seamless integration with *LDRA Testbed®* (for code review, quality review, design review and code coverage analysis of any test scenario) and *TBrun®* (for automated unit testing including test harness generation, test case generation, test report creation, Host/Target test execution and test regression)
- Requirements structural coverage analysis and impact analysis
- Automatic detection of changes to requirements, source code and test data
- Upstream and downstream impact analysis which helps with regression risk management

Interfaces

TBreq/TBmanager is the easiest way to link requirements, design, development, testing and verification workflow with your Requirements Management tools and your design and development tool chain. These include text processing tools, requirements management tools, project management tools, defect tracking tools, UML tools, modeling & design tools and code files.

Resources

You can find out more about requirements traceability by reading the LDRA articles on:

- “Requirements driven development”
- “Defects lurk in requirements”
- “Requirements management to reduce defects & improve quality”

These articles, white papers and demos can be found by visiting:
www.ldra.com/tbreq

For more information or to arrange a demonstration

W: www.ldra.com E: info@ldra.com

