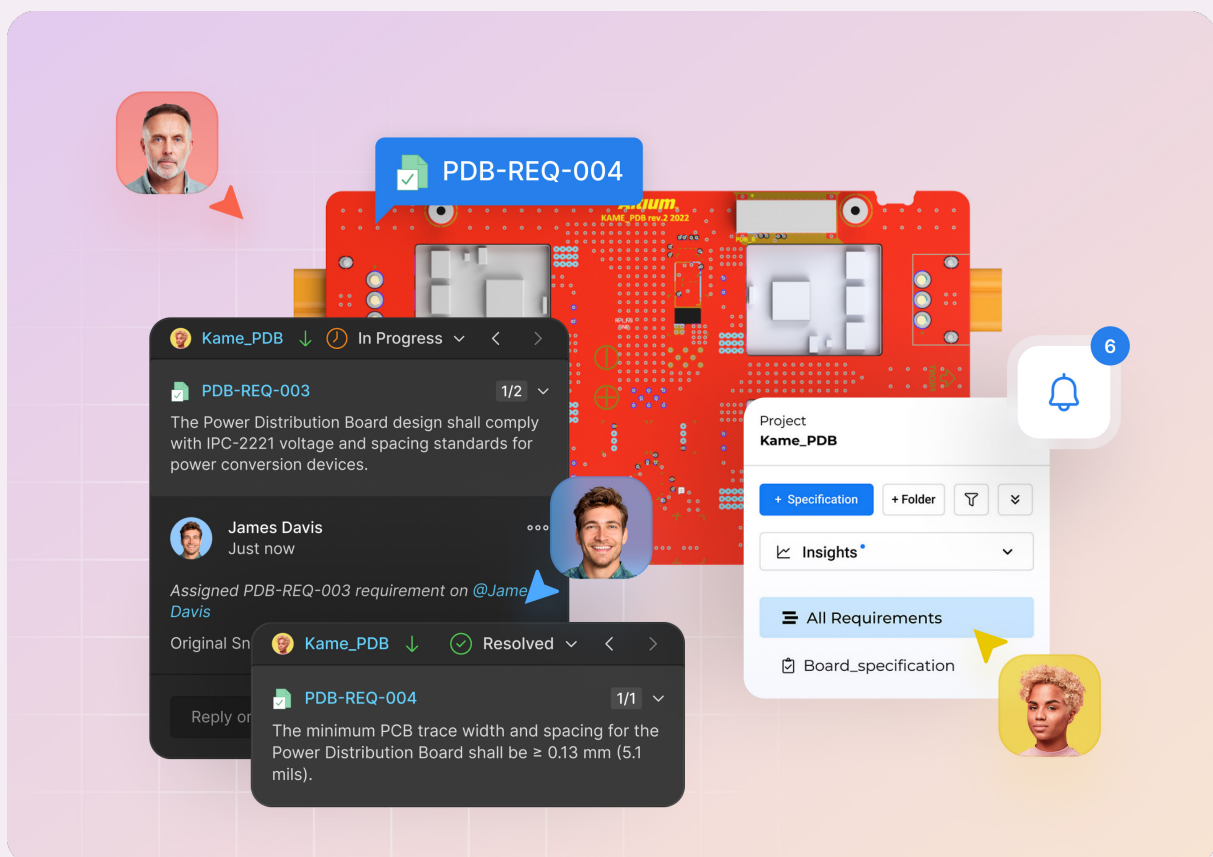




GUIDE

Requirements Management for Modern Electronics Teams

When is it the right time to move away from spreadsheets and upgrade to a dedicated requirements management tool?



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Moving Away from Document-Based Requirements Management: Why Make the Switch?

Electronic engineering teams are driving innovation—developing cutting-edge products and transforming how we interact with the world. Yet despite working on some of the most complex and high-stakes projects, many still manage requirements in static documents or notes on schematics.

In theory, requirements can be tracked with simple documents or even pen and paper. Document-based requirements management offers flexibility and allows teams to use familiar tools. But as product complexity increases or parallel projects multiply, this approach begins to break down.

When it does, wasted time, miscommunications, and version control issues cause costly delays—often far outweighing the investment in a dedicated requirements management tool.

Altium research shows that more than 50% of electronics engineer teams still manage requirements using spreadsheets, documents, or general-purpose task trackers like Excel, Word, or Jira.

For fast-scaling hardware companies and engineering and manufacturing services (EMS) managing multiple customer projects, this fragmented approach spreads requirements across disconnected systems, creates communication gaps, and introduces compliance risks—slowing design cycles and driving up hidden costs.

Common hidden costs include:

- Project delays
- Board respins
- Product recalls
- Slower time to market
- Loss of talented engineers
- Wasted engineering hours
- Lost profits

In this guide, you'll explore the limitations of document-based requirements management, learn how to recognize when it's time to move beyond spreadsheets, and read how electronics teams unlocked value by switching to a specialized tool.

Relative Cost of Resolving Errors in Requirements for Hardware Products

Requirements Definition	1x
Design Phase	3-8x
Physical Prototyping & Build Phase	7-16x
Testing & Integration Phase	21-78x
Operation Phase	29-1500x

Source: [NASA](#)

Time to Market Matters More Than Product Development Cost

Scenario 1: Late Delivery	100% to budget	6 months late	-33% profit loss
Scenario 2: Overspend	150% to budget	0 Months late	-4% profit loss

Source: [McKinsey](#)

Limitations of Managing Requirements in Documents and Spreadsheets

For electronics teams, managing requirements in documents is the norm. Requirements are passed to engineers as spreadsheets, and changes are communicated through email or review meetings. At first this feels manageable, but versions quickly drift, details get lost, and miscommunication grows. These issues stack up fast, leading to project delays and costly board respins.



Scattered and Outdated Specs

Requirements live in too many places: emails, spreadsheets, notes. Disconnected from electronic designs, specs quickly become outdated or contradictory, leading to design errors and wasted effort.



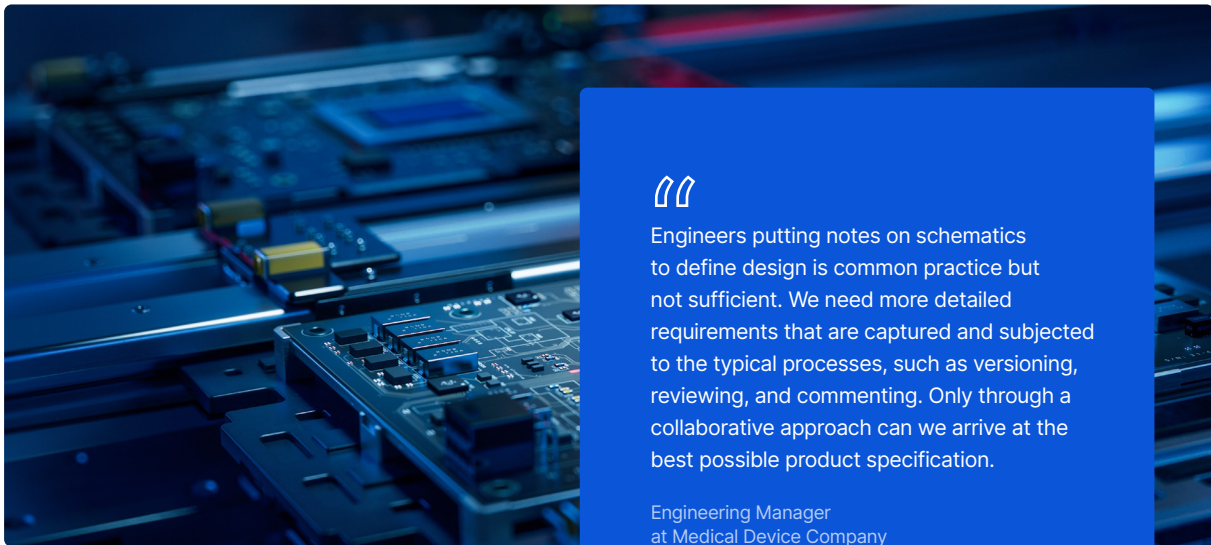
Teams Struggling to Stay Aligned

Specifications often evolve and change during design. Without a shared view across Electronics, firmware, and mechanical teams, gaps slip through, leading to late-stage rework, respins, and integration headaches.



Wasted Time and Quality Costs

Engineers spend hours updating spreadsheets or gathering evidence to prove a requirement was implemented instead of designing. Managers lose visibility into project status, and compliance reporting turns into a manual time sink.



Engineers putting notes on schematics to define design is common practice but not sufficient. We need more detailed requirements that are captured and subjected to the typical processes, such as versioning, reviewing, and commenting. Only through a collaborative approach can we arrive at the best possible product specification.

Engineering Manager
at Medical Device Company

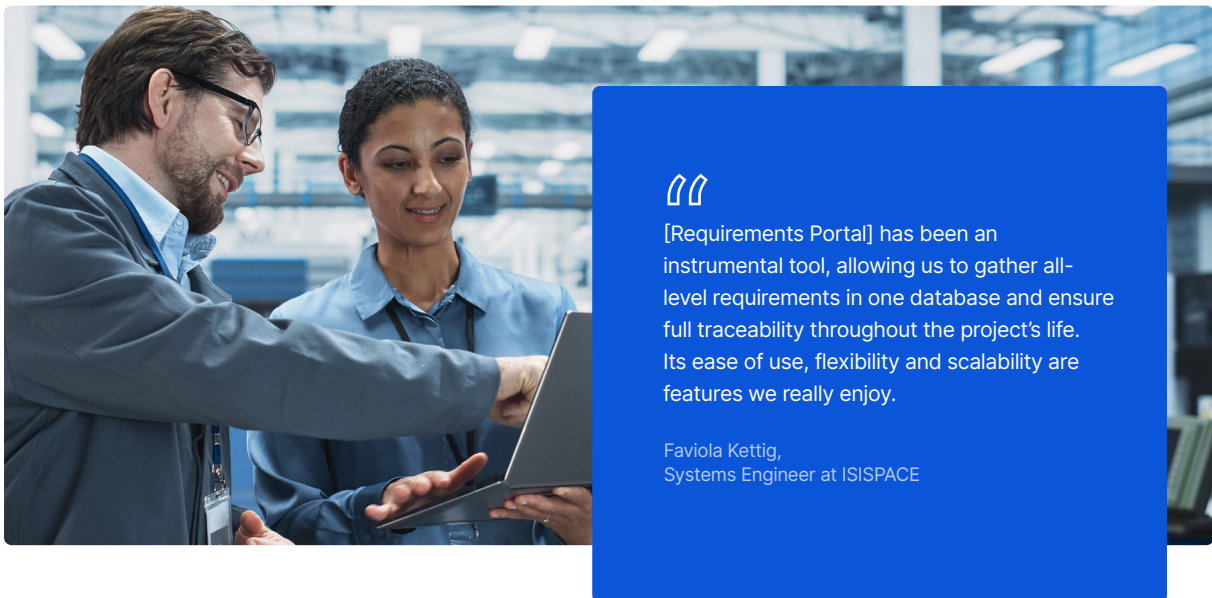
When Is It Time to Upgrade to a Dedicated Requirements Management Tool?

As project, design, or regulatory complexity increases—or as your team grows—a dedicated requirements management tool can significantly improve efficiency and reduce risk.

Readiness Checklist

You should consider making the switch if at least three of the following apply:

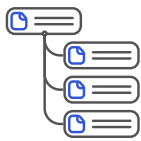
- ☐ Your team is about to start working on a new product or project.
- ☐ Your team has 10 or more engineers.
- ☐ You deliver 3 to 5 engineering projects per month.
- ☐ You spend more than 2 hours per week just managing requirements.
- ☐ You manage projects with 100 or more requirements on a regular basis.
- ☐ Your team spends significant time proving that all requirements have been addressed.
- ☐ You had to deal with costly design rework due to missed requirements at least once.
- ☐ You could have avoided board respins if a requirement error had been caught earlier.
- ☐ The requirements you designed against were not aligned with customer expectations.



Best Practices for Effective Requirements Management

Implementing requirements management best practices helps teams stay aligned, reduce rework, and meet delivery timelines. The following steps outline a practical roadmap for engineering teams developing electronic hardware.

Tip: Choose a requirements management tool that integrates with your design toolchain and supports each of the following steps.



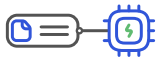
Break Down Incoming Requirements

Analyze high-level stakeholder requirements and break them down into actionable electronic specifications. Ensure all necessary design requirements are captured and traceable. Align early with all internal and external stakeholders to confirm scope and develop clear, feasible solution proposals.



Plan for Testing & Verification

Create a high-level test plan that outlines how each requirement will be verified—through analysis, simulation, design review, or testing. Plan verification activities early to ensure full coverage and minimize the risk of rework. Align verification expectations with your stakeholders to avoid delays and scope creep.



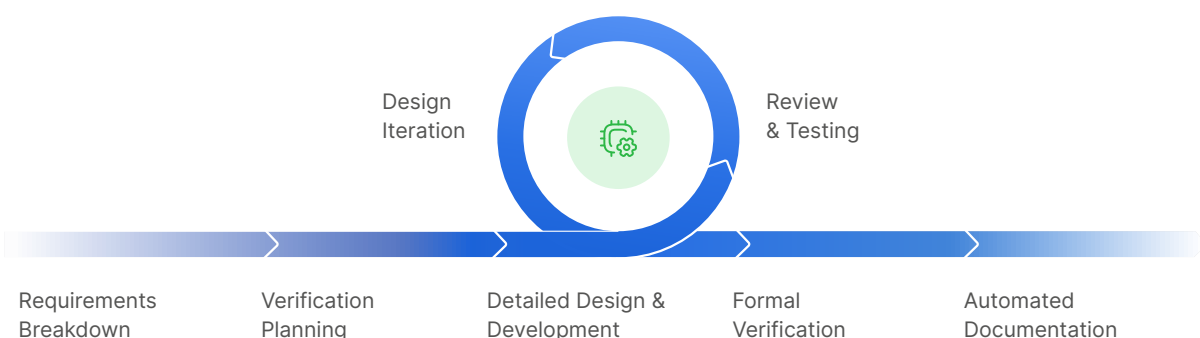
Connect Requirements to Designs

Use ECAD-integrated tools to link requirements directly to the design. Designers can view and implement requirements in context, while engineering managers can trace requirements down to specific design features to verify correct implementation. This reduces miscommunication and helps maintain efficient workflows.



Review Progress and Manage Compliance

Monitor project progress in real time to spot issues early and mitigate risk. Centralize testing and verification artifacts to simplify compliance documentation. Keep stakeholders informed with timely, data-driven updates and ensure on-time delivery of regulatory-compliant products.



Key Uses Cases of a Requirements Management System

A modern requirements management system supports every phase of development—from defining specifications to enabling continuous verification and collaboration. The following sections outline core capabilities that help engineering teams deliver projects on time and with confidence.

Centralized Requirements Management

Cloud-based requirements systems serve as a “single source of truth” for managing complex product development projects.

They provide easy access to up-to-date specifications, improve communication across teams, and allow real-time monitoring of project progress.

A user-friendly interface simplifies the capture and management of hardware requirements by eliminating unnecessary complexity.

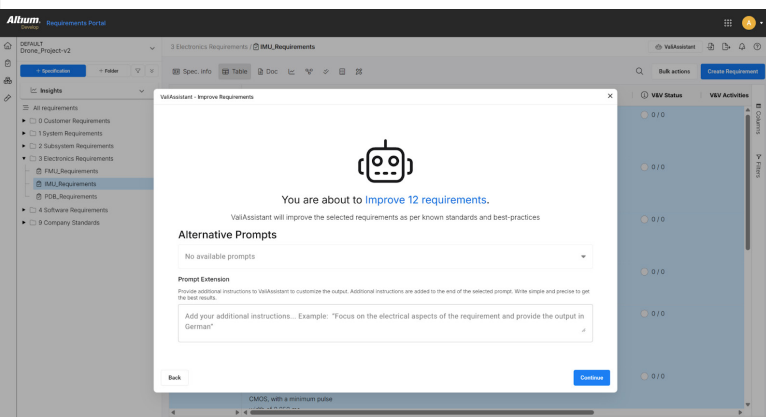
Identifier	Text	Applicable Block	Parents	Children	State	Methods	V&V Status
FMU-001	The FMU shall execute flight control loops at a minimum rate of 20000 Hz	FMU_PCB	FCS-005	FCSW-011 FCSW-012	Final	HW Design Review SW Test	1/2
FMU-002	The FMU shall support mission planning and execution for flight distances up to 20000 km	FMU_PCB	FCS-003	FCSW-013 FCSW-014	In review	SW Test SW Design Review	0/0
FMU-003	The FMU shall detect communication link loss and initiate return-to-home procedures within 100 s	FMU_PCB	FCS-006	FCSW-015 FCSW-016	Final	HW Test SW Test	1/1
FMU-004	The FMU shall initiate attitude control with a maximum error of 0.50°	FMU_PCB	FCS-007	FCSW-017	Final	HW Test SW Test	1/1
FMU-005	The FMU shall maintain attitude control with a maximum error of 0.50°	FMU_PCB	FCS-008	FCSW-018 FCSW-020	In review	Simulation	0/0
FMU-006	The FMU shall report communication link latency requirements with resolution of 100 ms	FMU_PCB	FCS-010	FCSW-019 FCSW-022	In review	HW Test SW Test	0/0
FMU-007	The FMU shall log flight telemetry at a minimum rate of 100 Hz with timestamp accuracy of 100 ms	FMU_PCB	FCS-011	FCSW-021	Final	HW Test SW Test	0/1
FMU-008	The FMU shall control control commands with a maximum jitter of 0.50 ms	FMU_PCB	FCSW-022		Final	HW Test SW Test	0/1

Cloud-based specification table showing parent-child requirement relationships and links to design references

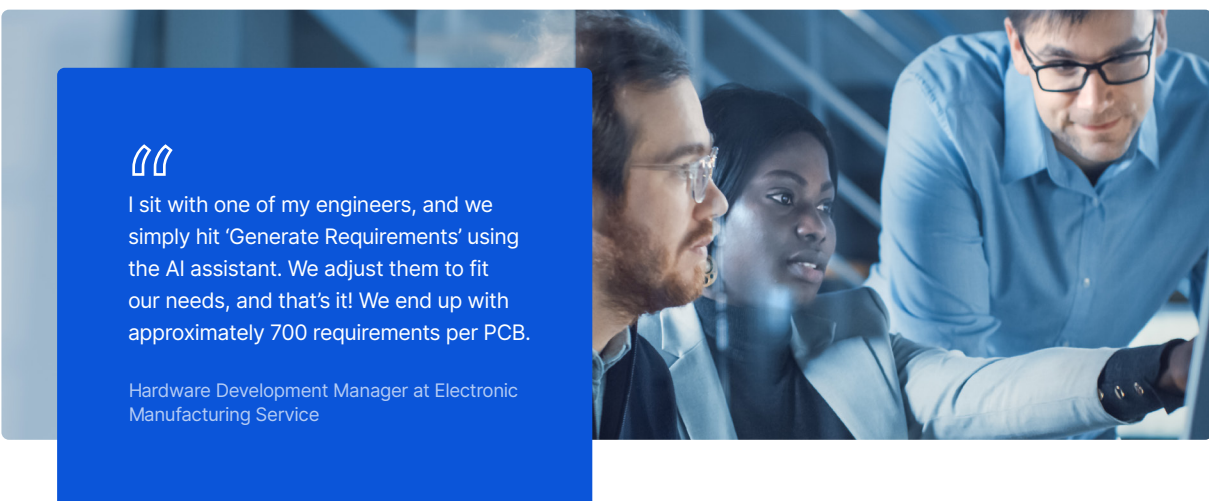
Requirements Definition and Breakdown—Assisted by AI

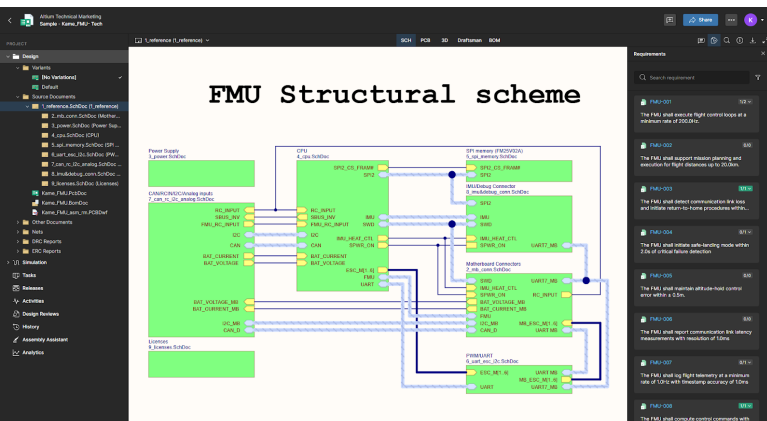
Requirements management is a rigorous, iterative process. Modern requirements management tools help break down high-level system requirements into clear technical specifications. At the same time they support the analysis, review, and versioning of requirements.

AI features can accelerate this work. With the help of an AI assistant, engineers can create high-quality, verifiable requirements faster while ensuring that no critical requirements are missed.



Improving requirements text for accuracy and clarity using an AI assistant





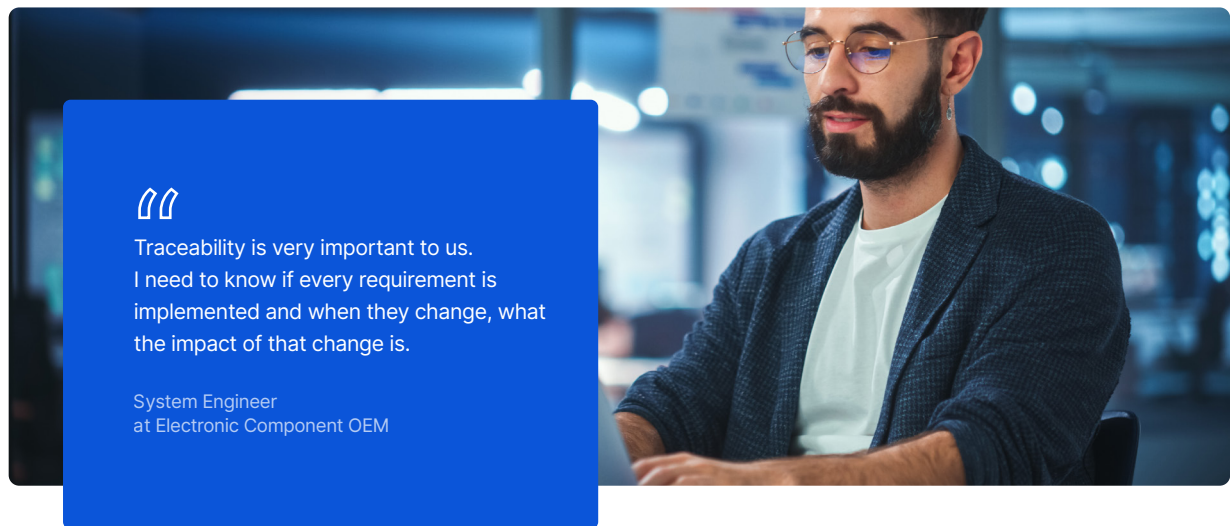
Viewing requirements alongside designs and tracing their implementation to specific design features

Traceability, Versioning, and Change History

Traceability features enable engineers to establish parent-child relationships between requirements and link them to relevant artifacts—such as PCB designs, V&V activities, and test cases.

Version control ensures that every change to a requirement is tracked, creating a complete and auditable change history log.

Together, traceability and versioning support design compliance, simplify impact analysis, promote accountability in design decisions, and improve transparency during audits.

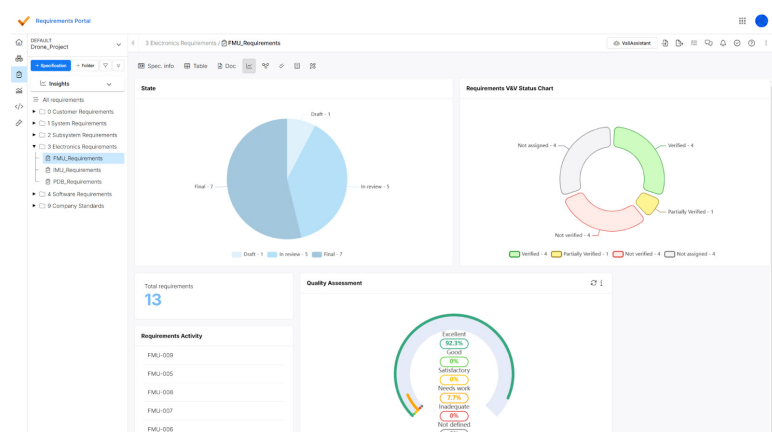


Dashboards, Analytics & Continuous Verification

Many R&D teams rely on manual updates or disconnected tools like Excel or Jira to track project progress. These methods often lack the context needed for well-informed engineering decisions.

Modern requirements management tools offer real-time dashboards that display data, such as the verification status of each requirement as development progresses.

Continuous verification dashboards help engineers detect noncompliant issues early, while managers gain accurate insights into project status. This data-driven approach uncovers risks well before final delivery and improves forecasting accuracy.



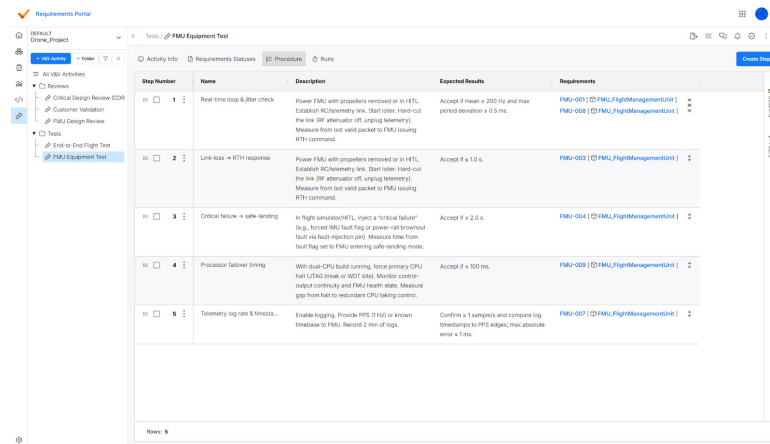
Dashboard showing a project's requirement verification status

Verification, Validation & Testing

Verification and validation (V&V) activities require structured planning, execution, and documentation.

Modern V&V tools enable teams to maintain full traceability between test runs and specifications, ensuring that all requirements are properly validated through review, analysis, simulation, or testing.

The ability to attach supporting evidence directly to V&V activities not only demonstrates compliance with design requirements but also streamlines the audit process by providing auditors with immediate access to all relevant documentation and data.



Step Number	Name	Description	Expected Results	Requirements
1	Real-time loop & jitter check	Power FMU with propellers removed or in HTL. Establish ICHchemistry link. Start timer. Hand-cut the link (RF attenuator off, various telemetry). Measure from last valid packet to FMU issuing RTN command.	Accept if mean < 200 Hz and max period deviation < 0.5 ms.	FMU-001 (FMU_FlightManagement) FMU-008 (FMU_FlightManagement)
2	Link-loss < RTN response	Power FMU with propellers removed or in HTL. Establish ICHchemistry link. Start timer. Hand-cut the link (RF attenuator off, various telemetry). Measure from last valid packet to FMU issuing RTN command.	Accept if < 1.0 s.	FMU-001 (FMU_FlightManagement)
3	Critical failure - safe-landing	In flight simulation/HTL, inject a "critical failure" (e.g., forced FMU fault flag or power-cut/brownout fault via fault-injection pin). Measure time from fault flag set to FMU entering safe-landing mode.	Accept if < 2.0 s.	FMU-004 (FMU_FlightManagement)
4	Processor failover timing	With dual-CPU build running, force primary CPU fault (CPU0 time or WDT fault). Monitor control output continuity and FMU health state. Measure gap from fault to redundant CPU taking control.	Accept if < 100 ms.	FMU-009 (FMU_FlightManagement)
5	Telemetry log rate & limits...	Enable logging. Provide PPS (1 Hz) or known timestamp to FMU. Record 2 sec of logs.	Confirm a 1 sample/s and compare log timestamps to PPS edges, max absolute error < 1 ms.	FMU-007 (FMU_FlightManagement)

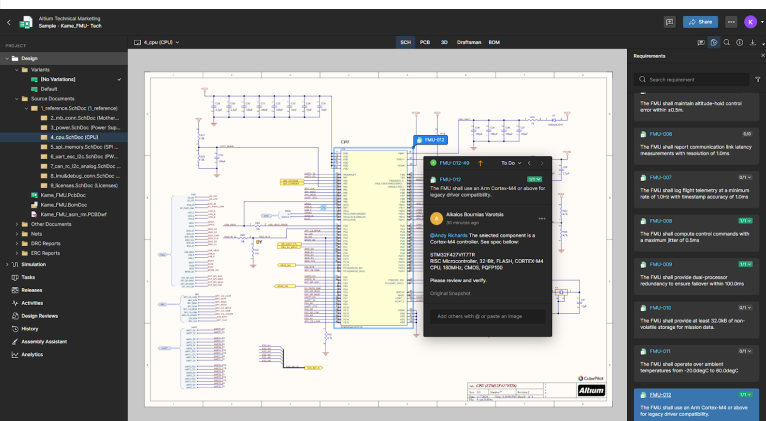
Procedure of a V&V activity clearly documenting test steps while linking them to requirements

Collaboration & Cross-Team Communication

Effective requirements management goes beyond capturing specifications—it's also about enabling collaboration.

A cloud-based system keeps engineers, QA, procurement, and other stakeholders aligned in real time, reducing communication gaps and redundant update requests.

By centralizing feedback and approvals, teams can iterate faster, maintain a clearer overview of project progress and health, and adapt quickly to customer needs.



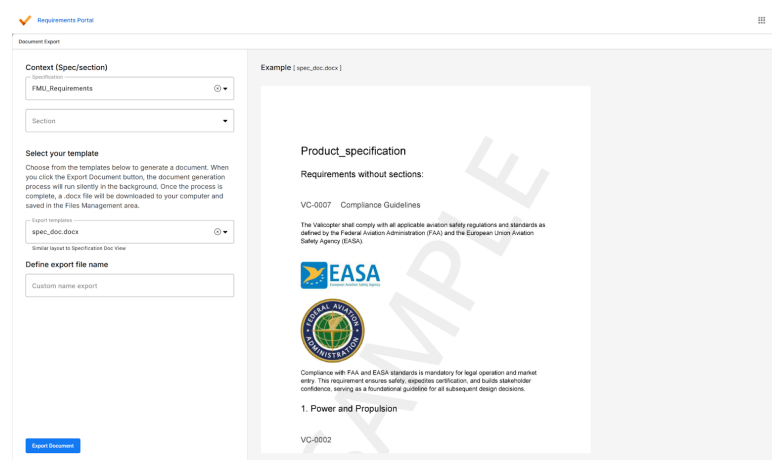
Requirements referenced in comments and listed on the side panel of a design in an Altium project

Automated Document Generation From Live Project Data

Hardware teams often need to generate formal documentation—such as traceability matrices or design conformance reports—to meet internal quality standards or prove regulatory compliance.

A modern requirements management tool automates document generation by pulling information directly from live project data. Customizable templates allow teams to quickly generate audit-ready reports without manual formatting or data entry.

This approach ensures documentation remains accurate and current while freeing engineers to focus on design work instead of paperwork



Automatically-exported templated specification document

Selecting the Right Requirements Management Tool

In a fast-paced engineering environment, the right requirements management solution can reduce friction, lower costs and accelerate product delivery. Consider these key criteria when evaluating potential tools:



Integration with Your Design Environment

The ideal requirements tool integrates seamlessly with your CAD environment so engineers can view requirements without switching contexts. Bidirectional integration ensures changes sync automatically, eliminating manual exports or duplicated data.



Traceability Across Electronics Development

Ensure the solution supports traceability between high-level stakeholder needs, engineering specifications, design files and verification activities. This includes linking requirements to schematics and PCB layouts to simplify change impact analysis, and to test procedures to ensure full coverage.



Ease of Use for Engineering Teams

The tool should be intuitive for Electronics engineers and familiar enough to minimize resistance during adoption. Look for a user-friendly interface, minimal training requirements and seamless editing and commenting capabilities.



Collaboration and Secure Data Sharing

When working in distributed teams or with external partners, being able to collaborate in real time while keeping your data secure is essential. Prioritize tools that offer cloud-native access and role-based permissions for smooth collaboration with customers and subcontractors.



Tool Flexibility and Workflow Support

Avoid overly rigid requirements management systems that require months to deploy and a complete overhaul of your processes. Choose a tool that supports your engineering workflows and can scale as your team's process maturity grows.



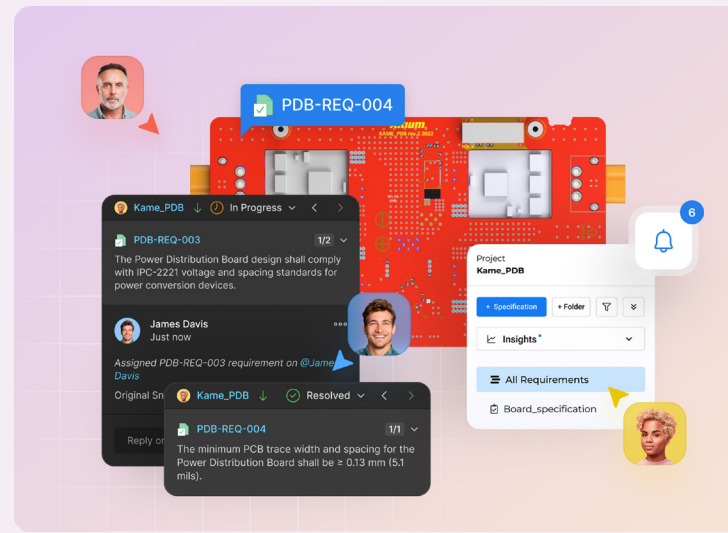
Total Cost of Ownership

Look beyond license fees and compare against quantifiable benefits: fewer redesigns, reduced engineering time, shorter time to market and improved project progress monitoring. Consider how the tool helps your team avoid unproductive time and deliver results faster.



Requirements Management

Capture requirements and link them to electronic designs, verifications, and test cases for full traceability and faster, more agile iterations.



Manage Requirements & Verification in One Shared Workspace

Bring electronics, systems, and verification engineers together in a shared environment for electronic product development. Choose a secure, scalable and intuitive environment for true product co-creation with full traceability, versioning, and change history.



Bring Requirements Where Design Decisions Happen

Work with requirements within your PCB design tools. Import, view, break down, and verify requirements to make design decisions with up-to-date specifications. Connect your requirements to align your team.



Trace Requirements from PCB Designs to Verified Hardware

Link system-level requirements to schematics, layouts, PCB features, verification activities and test runs. Maintain full requirements traceability, reduce the risk of missed requirements and support faster, more agile iteration cycles.



Track Project Progress & Ensure Quality

Track requirement implementation and verification in real time. Generate traceability matrices for audits from live data in minutes. Full change history turns compliance into a shared responsibility across the team, enabling you to compete in regulated markets.

Key Features

✓ Link Requirements Directly to PCB Designs

View live requirements alongside schematics and PCB layouts to minimize the risk of rework.

✓ Centralize Your Verification & Validation Activities

Plan, run, document, all your V&V activities in a centralized tool and trace them to requirements.

✓ Create Actionable Specs with an AI Assistant

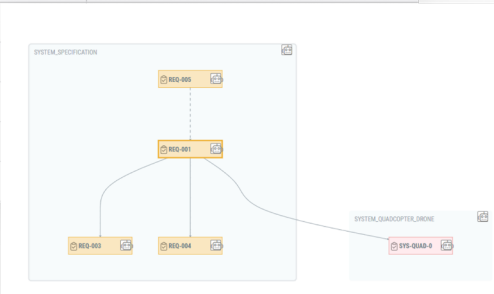
Write clearer, verifiable requirements in less time with AI-assisted automation.

[Start Demo](#)



Requirements Capability Overview

Name	Value	Display Unit
<input checked="" type="checkbox"/> f(x) Mass	0.61	kg
<input type="checkbox"/> f(x) Cost	293.7	EUR
<input type="checkbox"/> f(x) v_flight_time		
<input type="checkbox"/> f(x) v_max_range		
<input type="checkbox"/> f(x) v_max_speed		
<input type="checkbox"/> f(x) v_weight		
<input type="checkbox"/> > <input checked="" type="checkbox"/> PowerConsumption		



Manage Complexity with Linked Requirements

Directly connect requirements to designs, systems, V&V activities, and test runs to manage regulatory compliance and certification.

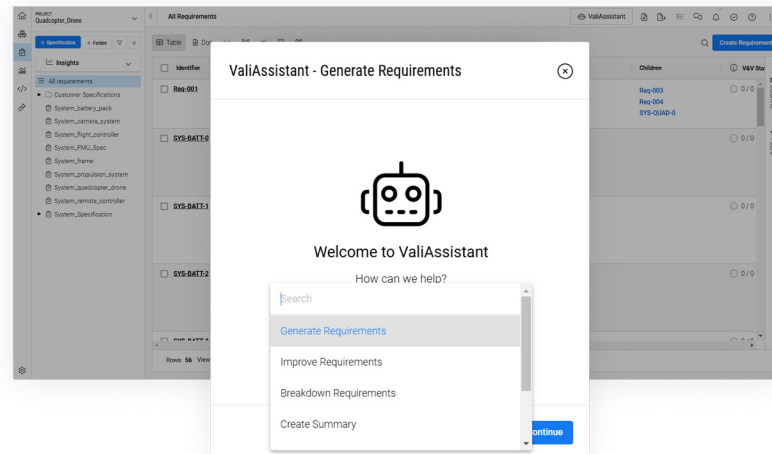
- ☒ Requirements Traceability
- ☒ Verification & Validation
- ☒ Parametric Requirements

[Learn More](#)

Automate Requirement Workflows to Increase Productivity

Leverage modern technologies to accelerate processes and improve workflow efficiency with AI and automation.

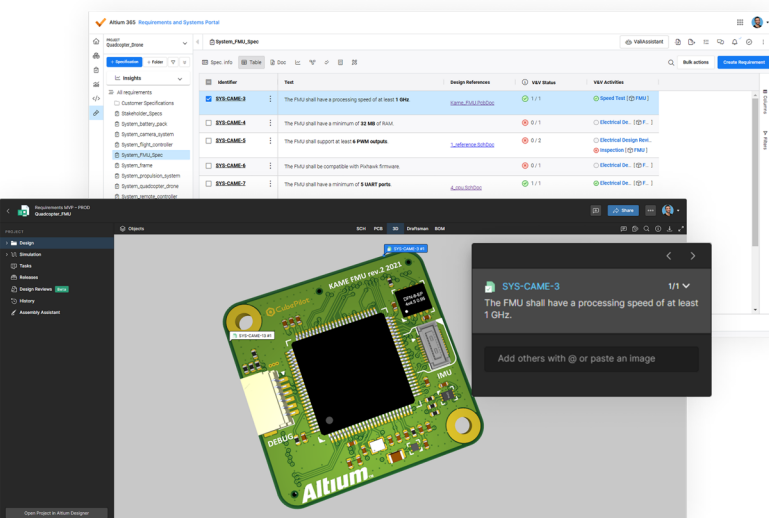
- ☒ AI Requirements Assistant
- ☒ Smart Requirements Importer
- ☒ Templated Document Exporter

[Learn More](#)


Enhance Team Performance with Live Collaboration

Empower your engineers to make better-informed decisions with constant access to up-to-date requirements and system data.

- ☒ Live Dashboards & Analytics
- ☒ Versioning & Change History
- ☒ Live Comments & Alerts

[Learn More](#)


Providing Value to Your Business

Deploying a requirements management tool improves efficiency and delivers measurable savings. Here are three ways to quantify the return on your investment:

Reduce the Risk of Rework

Rework includes any engineering time spent on redesigns and board respins. Scattered, changing or unclear requirements are often the root cause. Without a central tool, it is challenging to ensure your team is working with current information—leading to inevitable project delays.

ROI Calculation	(Total engineering budget per project)	× (Percentage of total rework)	× (Percentage of rework due to requirements)	=	(Savings with effective requirements management)
Example	\$1,000,000	× 15%	× 50%	=	\$75,000 / project

Minimize Unproductive Engineering Time

Are your engineers spending more time on documentation than on design work? A collaborative requirements tool creates a single source of truth and involves all relevant stakeholders, streamlining each step of the process and reducing unproductive time across the team.

ROI Calculation	(No. engineers working on requirements)	× (Avg. hourly engineering salary)	× (Hours per month wasted on maintaining requirements)	=	(Savings with effective requirements management)
Example	10	× \$40 / h	× 20 h / month	=	\$8,000 / month

Eliminate Production Defects From Missed Requirements

Contract manufacturers that provide custom solutions often juggle multiple projects each month. A tool that manages requirements helps ensure none are overlooked during design—preventing respins and production downtime.

ROI Calculation	(Production cost per project)	× (Number of projects per month)	× (Percentage of downtime or defects due to missed requirements)	=	(Savings with effective requirements management)
Example	\$2,000 / job	× 5 jobs / month	× 40%	=	\$4,000 / month

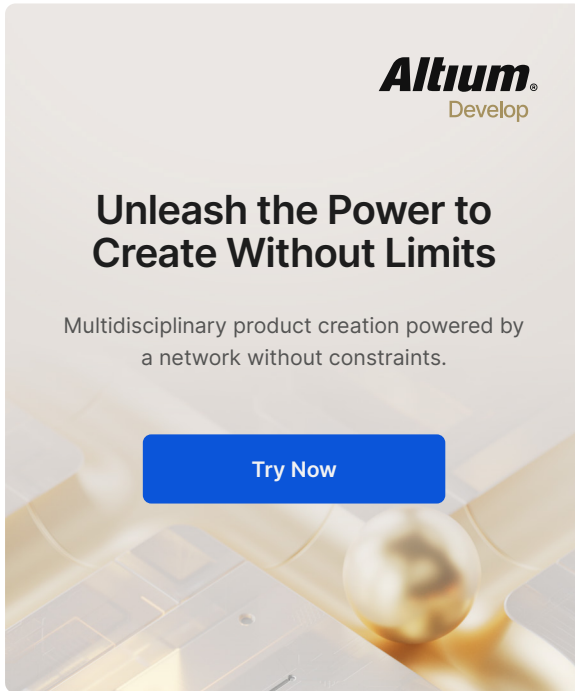
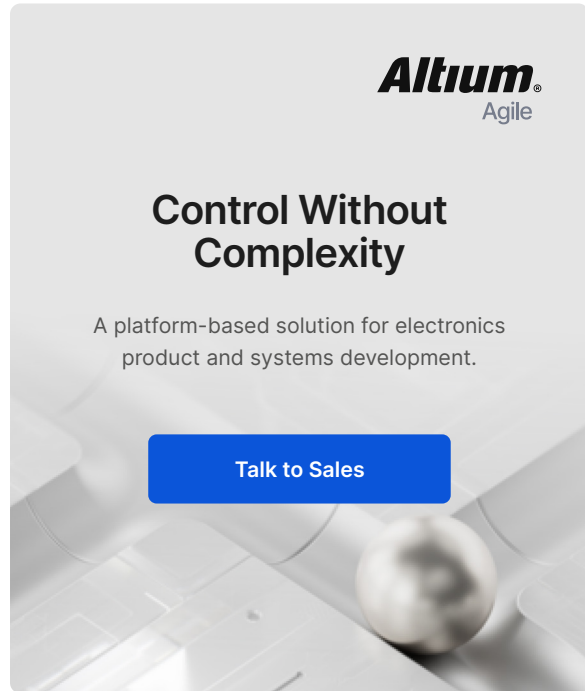


The ROI is FAST. We design three to five products a month, and reprints can easily increase our costs by 40%. [Requirements Portal] has saved us a lot of downtime in production. We basically got our value back in a couple of months.

Samuel Gosselin – Project Manager
(R&D & CI) at Memtronik Innovations

Requirements in Altium

Altium's requirements management and V&V capabilities are purpose-built for electronics teams. Available in Altium Develop and Altium Agile, they replace scattered spreadsheets with a collaborative, versioned and traceable environment that integrates directly with your design and verification workflows.

A promotional banner for Altium Develop. It features a background image of a circuit board with a glowing yellow sphere. The Altium logo is in the top right, with 'Develop' in smaller text below it. The main headline is 'Unleash the Power to Create Without Limits'. Below it is a sub-headline: 'Multidisciplinary product creation powered by a network without constraints.' At the bottom is a blue button with the text 'Try Now'.A promotional banner for Altium Agile. It features a background image of a circuit board with a glowing silver sphere. The Altium logo is in the top right, with 'Agile' in smaller text below it. The main headline is 'Control Without Complexity'. Below it is a sub-headline: 'A platform-based solution for electronics product and systems development.' At the bottom is a blue button with the text 'Talk to Sales'.

We've found [Altium's Requirements Portal] to be a game-changer in our product development process. The structured approach to documenting requirements has streamlined our workflow, making it easier to manage and organize project specifications effectively. Working with requirements is both productive and enjoyable.

Alf-Einar Løberg
Department Director at Sensio

Ready to Elevate Your Requirements Management?

Drop spreadsheets and upgrade to a dedicated requirements management tool for all your electronics projects. Capture requirements, trace them to designs, and track their verification for less rework and faster iterations.

- ✓ Bring Requirements Where Design Decisions Happen
- ✓ Trace Requirements from Designs to Verified Hardware
- ✓ Track Project Progress & Ensure Quality

Take the Next Step

Create an Altium Develop or Altium Agile Teams account to start your free 30-day trial.

[Try Now](#)[Talk to Sales](#)