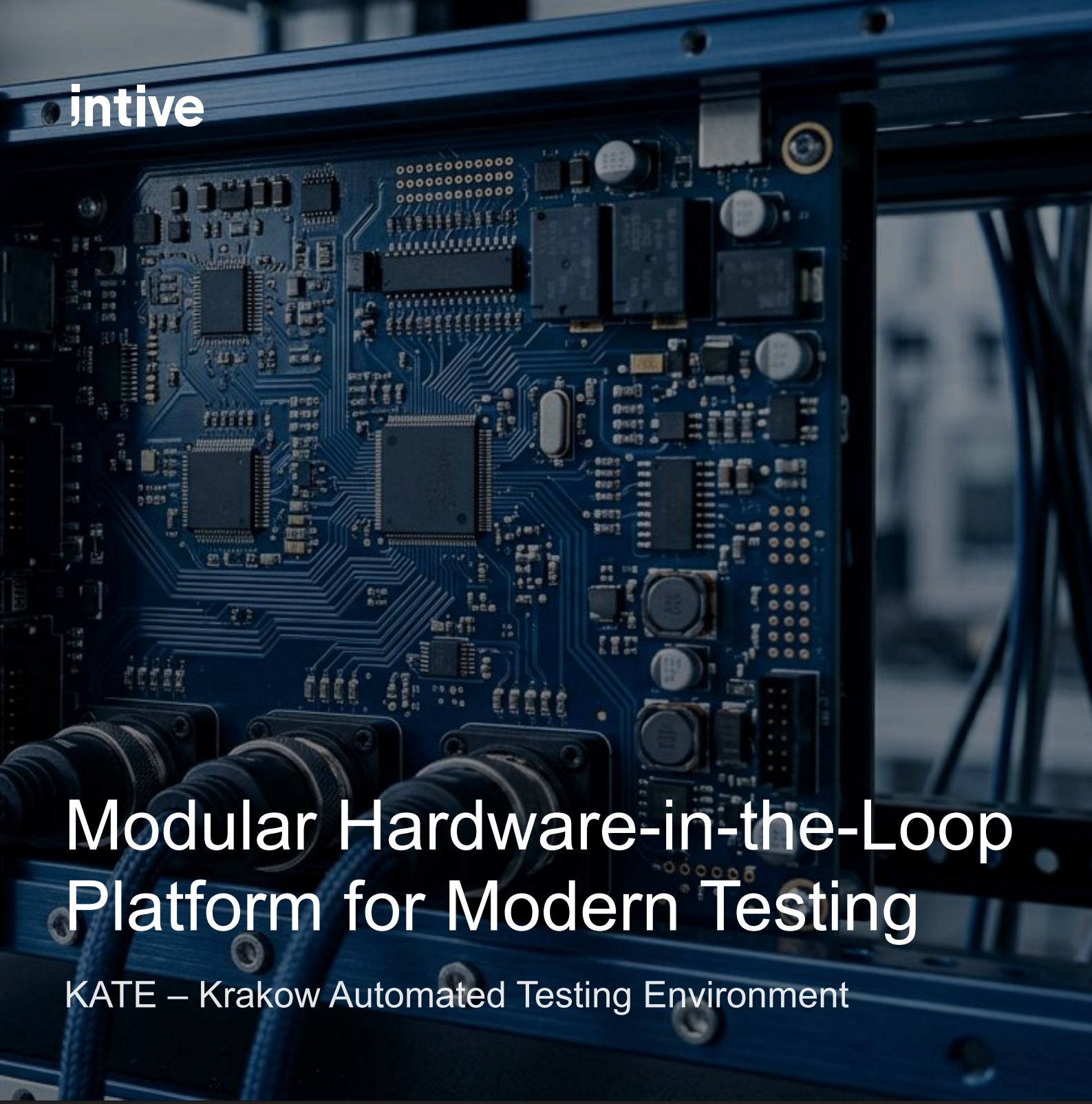

Modular Hardware-in-the-Loop Platform for Modern Testing

KATE – Krakow Automated Testing Environment

Where your complex systems come to life today

In early-stage validation, ensuring that embedded systems work reliably under real-world conditions is no small task. Many traditional HIL setups are expensive, inflexible, and slow to adapt.

That's where KATE steps in. Developed to support modular, automated, and traceable testing, KATE allows teams to connect their software directly to hardware subsystems like ECUs and BMS.

With capabilities like automated fault injection, high-resolution signal simulation your validation workflows become faster, repeatable, and traceable – reducing time-to-first-test and lowering overall development risk.

KATE's flexibility and scripting APIs make it ideal for small and medium sized companies developing their own embedded solutions, automotive OEMs, Tier-1 suppliers, research labs, and system integration teams who need modular benches for functional verification, continuous integration, and reliable testing of complex, safety-critical interactions – long before production begins.

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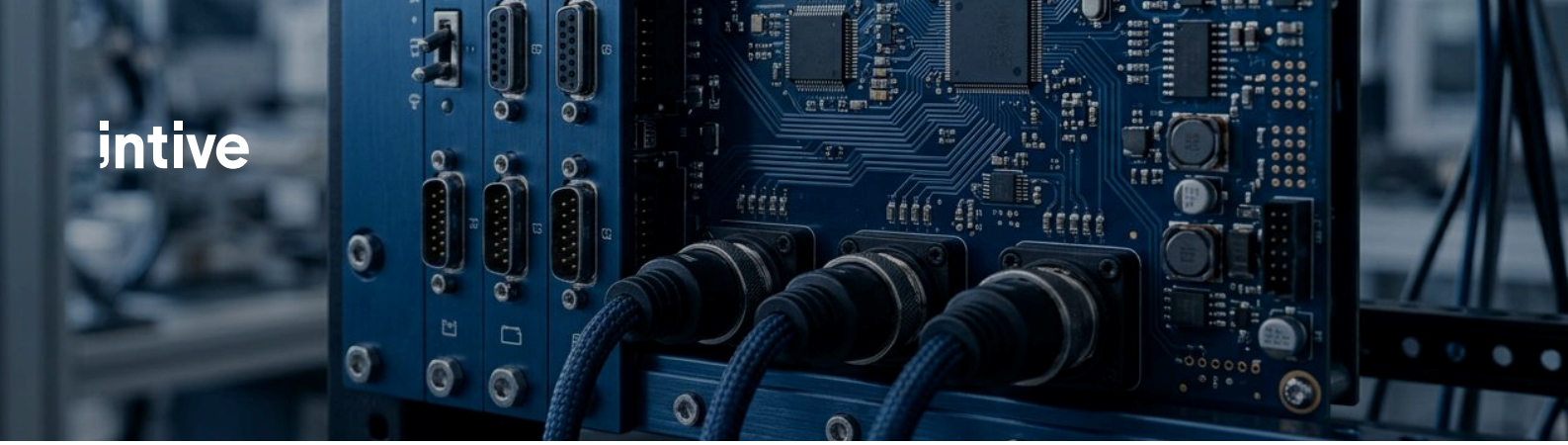
https://www.intive.com/services/embedded-software



From Requirements to Results – Faster and More Effective

In traditional environments, setting up tests and integrating them into development workflows can be slow and inconsistent.

KATE streamlines this process by enabling:

- Rapid assembly of tailored test benches using modular hardware
- Immediate test execution with ready-to-use example scripts
- Automation in familiar programming languages (Python and C#)
- Seamless integration into CI/CD pipelines

With detailed logging and reproducible test execution, teams can quickly identify root causes, debug intermittent issues, and reduce verification cycle time.

Real Flexibility for Real Projects

KATE adapts to your project, exactly the way you need it.

Hardware Customization

- Combine base controller with function-specific modules
- Add or swap modules as requirements evolve
- Scale from component-level to subsystem testing

Extended Capabilities

- Integration with external high-voltage power supplies
- SCPI-controlled peripherals for automated, safe pack-level testing

Software Freedom

- Fully customizable test logic in Python and C#
- Configuration-based setup for modules
- Expandable ecosystem with future modules and templates

Built for Engineers, Designed for Teams

KATE prioritizes usability and fast onboarding with:

- Native Python and C# libraries / API
- Ready-to-use example repositories
- Hands-on workshops and “KATE Expert” practices
- Documentation

This developer-centric approach ensures teams can quickly adopt the platform, create maintainable test suites, and operate labs with confidence and consistency.

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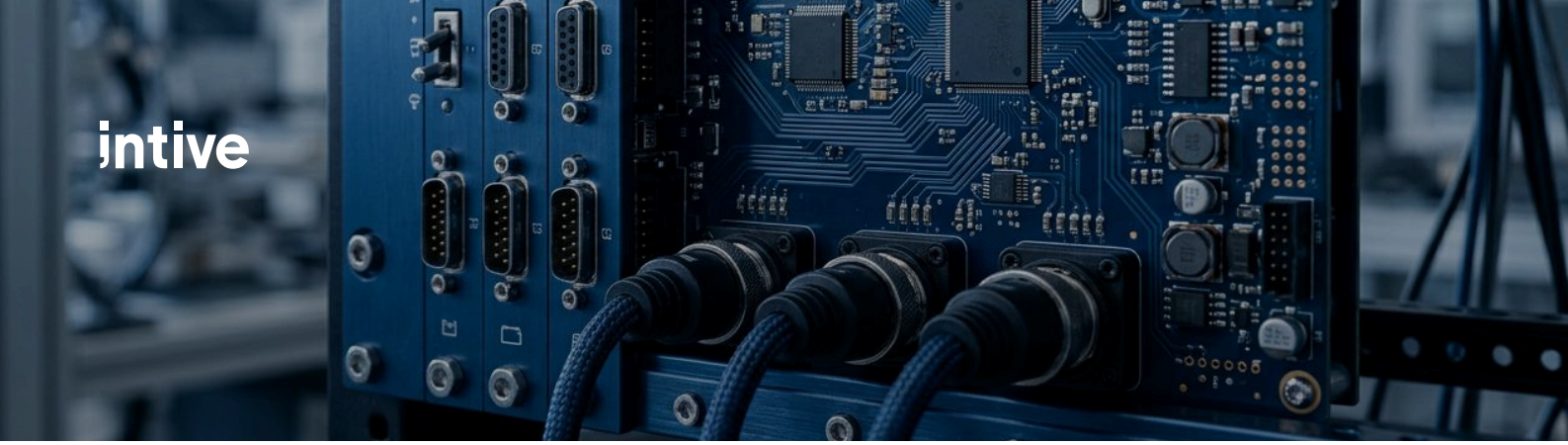


Solving the Industry’s Biggest Testing Challenges

KATE addresses key pain points across validation workflows:

- Modular purchasing reduces upfront investment
- Reconfigurable hardware adapts to changing needs
- Automated fault injection and detailed logging

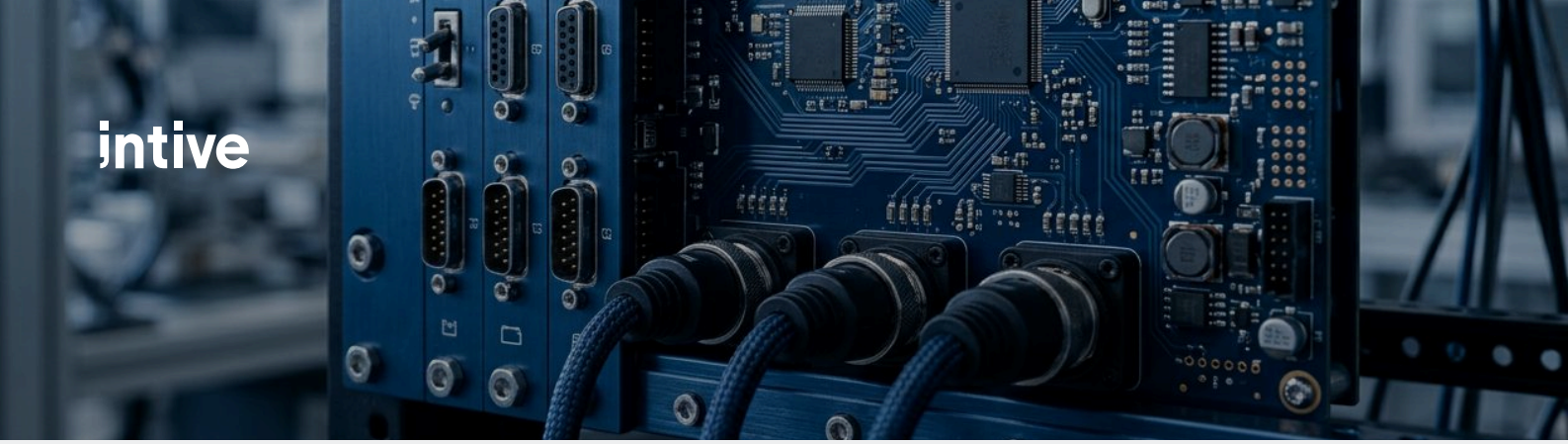
The result:

- Lower total cost of ownership
- Faster time-to-first-test
- Improved reproducibility
- Reduced development risk and delays

KATE Modules

It’s a fully customizable Hardware-in-the-Loop (HIL) system, expandable when needed with a comprehensive range of modules to choose from. Quick and easy configuration, combined with intuitive hardware and software design, enables a smooth and efficient workflow.

Module	Functionality
BASE MODULE	• Backbone and Command and Control module of KATE system • Enables networking capabilities of the system, allowing HIL setup to be accessible on-line • Monitor status of the slave modules • Provides key information about system with quick glance at Base’s lcd display
POWER MODULE	• 2 independent channels to connect and control up to 2 power supply units • graphic displays for each channel • input-reversed polarity detection and protection • reverse-current detection on each output pin • ultrafast input alternating to desired output for voltage drop tests • fast measurement burst mode for measuring transient currents and voltages • voltage and current consumption measurements



SENSOR MODULE

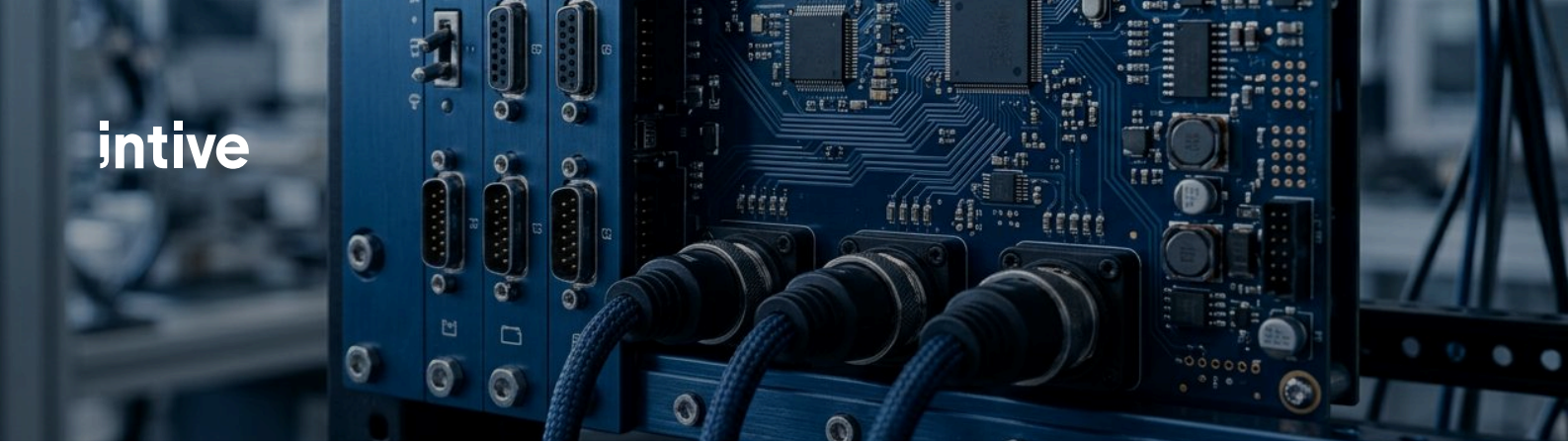
- 2 independent channels to connect up to 2 inputs of an ECU
- resistor decade for resistance emulation in range 10R-150K
- generation of PWM signal
- voltage generation in range from 0 to 30V
- relays for short circuit between the ECU input lines, swapping ECU input lines, short to supply & ground, open circuit etc.
- two independent, fully isolated current sensors
- measurement points on the front panels

LOAD MODULE

- 2 independent channels to connect up to 2 outputs of an ECU
- electronic load with constant current/resistance with overload protection
- PWM signal parameters measurement
- relays for short circuit between the ECU input lines, short to supply & ground, open circuit etc.
- two independent, fully isolated current sensors
- measurement points on the front panels

RELAY MODULE

- 6 SPDT relays 10A 30V
- 10 SPST relays 10A 30V
- independent operation of each relay
- switching time - 20ms

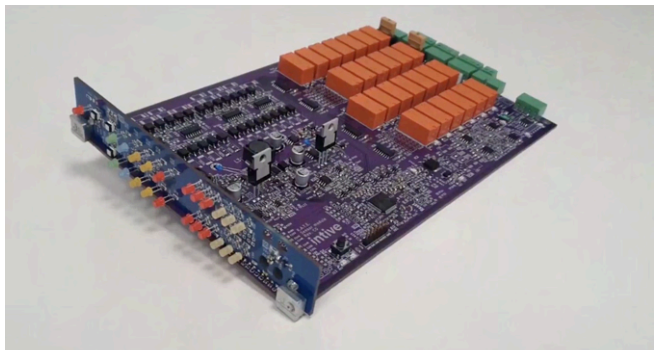


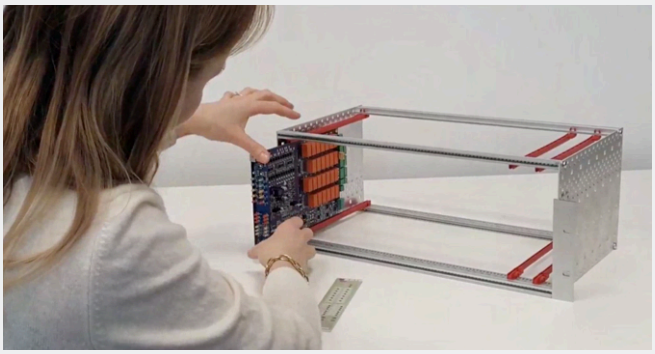
Who Benefits Most from KATE?

KATE is particularly valuable for:

- Detecting systemic risks early
- Making audits predictable and stress-free
- Bridging engineering, quality, and management
- Reduced audit risks and findings

These teams rely on repeatable, traceable testing and need flexible environments to validate complex hardware-software interactions efficiently.





KATE fundamentally changes the rules of the game by **shifting the engineering focus from manual scripting to high-level intent.** By leveraging integrated AI, the platform ingests raw requirements and automatically transforms them into structured test descriptions.

Ready to Transform Your Testing Process?

KATE bridges the gap between flexibility, automation, and engineering efficiency. From rapid prototyping to full validation workflows, it empowers teams to test smarter, faster, and with greater confidence

Contact our sales:

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Visit our website:

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