

A photograph of an automotive assembly line. In the foreground, a robotic arm is positioned over a silver car chassis. In the background, several workers in blue uniforms are working on other cars. The factory floor is marked with yellow lines, and various technical diagrams and equipment are visible on the walls and overhead.

Automated Vehicle Level Diagnostic Validation (VDV) Test Setup with Fault Insertion Unit (FIU) (Automotive Industry)



## Client Background

Client is an Indian multinational automotive manufacturing company, headquartered in Mumbai, India, which is part of the Tata Group. The company produces passenger cars, trucks, vans, coaches, and buses

The project involved creating an Automated Vehicle Level Diagnostic Validation (VDV) Test Setup with a Fault Insertion Unit (FIU) to ensure the quality assurance of Emission type Electronic Control Units (ECUs) according to international standards. The system provides both automatic and manual modes for testing, offering a versatile solution for various pin configurations used by premium car manufacturers. The software features a user-friendly GUI for test execution, parameter configuration, offline analysis, and report generation.



## Challenge

The primary challenge was to develop a comprehensive Automated Test Equipment (ATE) system capable of acquiring, monitoring, and validating the performance of Emission type ECUs. The system needed to handle different fault techniques, such as open circuit tests, short to battery, and short to ground tests, across 204 pins. It also had to offer both automatic and manual testing modes while maintaining high accuracy and reliability in test results.

## Engagement Journey

Started With



Extended To



Ongoing Support



## Solution

The ATE system was designed to provide a versatile testbed with 204 pins, capable of performing various fault techniques like open circuit, short to battery, and short to ground tests. The configuration of these pins is selectable through the software, which offers both AUTO and Manual modes for testing.

In AUTO mode, the system automatically selects test parameters, creates, and removes faults, executing tests according to a predefined sequence. This mode streamlines the testing process and ensures consistency. In Manual mode, users can manually select test parameters and perform tests, allowing for greater precision and control over specific test conditions.





## Solution

The software features a user-friendly GUI that facilitates test execution, parameter configuration, offline analysis, and report generation. It enables users to conduct tests efficiently, configure parameter limits, and generate comprehensive test reports, ensuring a seamless testing experience.



## Benefits

1. Efficiency: Automatic selection of test parameters and fault handling in AUTO mode streamlines the testing process, reducing the time and effort required.
2. Precision: Manual mode allows for precise control over test parameters, ensuring accurate and detailed test results.
3. Versatility: The testbed's ability to handle any ECU with any pin configuration makes it suitable for a wide range of applications in the automotive industry.



## Benefits against alternatives

1. Automation: The AUTO mode offers significant time savings compared to manual testing methods, enhancing productivity and consistency in test results.
2. Flexibility: The combination of AUTO and Manual modes provides a level of flexibility not commonly found in other testing systems, allowing users to switch between automated and manual testing as needed.
3. Comprehensive Fault Testing: The system's ability to perform various fault techniques across 204 pins provides a more thorough and reliable testing process compared to alternatives with limited fault testing capabilities.



## Value Proposition

The Automated VDV Test Setup with FIU offers a seamless testing experience for Emission type ECUs. Its accurate acquisition and monitoring capabilities, user-friendly GUI, and streamlined testing process with configurable fault techniques ensure high-quality assurance. The system's versatility in handling any ECU pin configuration, coupled with the efficiency of AUTO mode and the precision of Manual mode, makes it an invaluable tool for premium car manufacturers seeking reliable and comprehensive ECU testing solutions.