

## Test Development Solutions

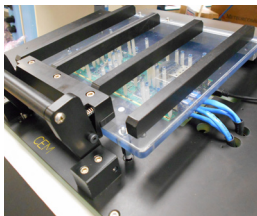
Benchmark is a leader in delivering high quality, custom turnkey automation and test solutions. With a dedicated team of test engineers, technicians, and assemblers, and the added benefit of product design engineers test development plays a vital role in Benchmark's commitment to our customers.

### Manufacturing Ready Solutions

One underlying goal of the team is to provide manufacturing-ready test solutions. The key aspects of a high-quality, manufacturing-ready test solution include:

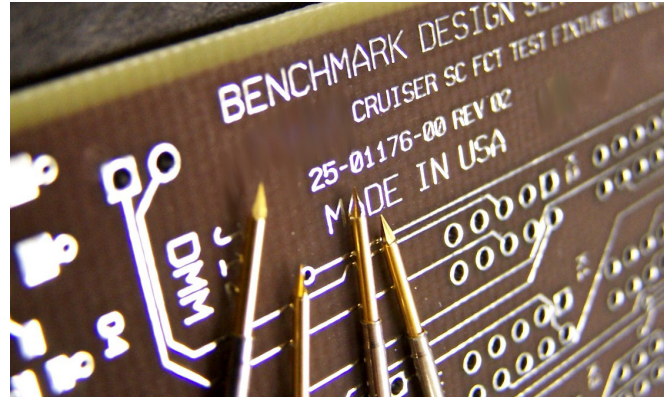
- ISO 9001 compliant documentation
- Access & tools to enable good test coverage
- Industry-standard instrumentation
- Automated data collection
- Proper ESD safe tester designs & materials
- Operator friendly - minimal operator interaction
- Electronic data archiving, security, and availability
- Test operator safety
- Integration with manufacturing quality management systems
- Consistent, clean, organized, and mature tester image

### Quality Test System Integration



Benchmark's propriety process control tools track each circuit assembly and subassembly through component placement and assembly to inspection and test procedures. These systems

ensure every product manufactured is successfully run through each specified test process step. Benchmark's testers are tightly integrated into these process control systems and automate quality control to verify test code versions, operators, and product software.



In addition, Benchmark has developed a statistical analysis application for test system release and ongoing review of parametric test data. The test system analysis includes Gauge R&R using the ANOVA method.

In manufacturing, parametric data is reviewed to provide an early warning if the data is impinging on test limits. Customers are able to view the parametric test data for the product in real-time via an online portal.

### Custom Test Development

To minimize development time and cost, Benchmark's test developers apply a standard test design platform. When standard test solutions are not able to be used, our developers have designed custom test solutions for a variety of products.

A custom tester design is based on a standard process but can branch in unique directions to accommodate product-specific test instrumentation, cable connections, shielding, lighting, etc.

### RF Test Solutions

Many products have a wireless communication requirement. The requirements varies from Wi-Fi, Bluetooth, and GPS to cellular communications and propriety wireless links. Testing all of these interfaces can be a challenge. The manufacturing environment can induce even more challenges considering competing product radios and general noise in the manufacturing environment. Our test development team has extensive experience providing solutions for RF and telecommunication systems.

## Standard Test Platforms

Starting the test development process from the ground up requires extra time and cost. Benchmark has developed three standard approaches for testers, which are then customized to fit product-specific test needs.

### Edge Tester

The edge tester is a great solution to test products which require minimal test instrumentation and fixturing. It can be used for both board level test, high level assembly (HLA) device testing, and be configured as a programming or boundary scan station. The edge tester is used for high volume production as the replication cost is easily managed.



### Target Tester

The target tester uses a mass interconnect and a removable fixture. Applying this method allows many products to be tested on the tester platform by swapping in a different product-specific fixture.



The standard suite of instrumentation is exchanged or augmented if specific test instrumentation is required by product test definitions. Fixture swap out time is minimal while the reuse of the investment in test equipment is maximized.

### STEP One Tester

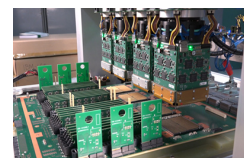
The STEP One tester is a great starting point for any solution which needs a variety of test equipment whether it be PXI, LAN, or GPIB.

It has a mass interconnect for providing signals from the instrumentation to the product fixture. It is especially suitable for products requiring a work surface during test.



## Test Automation

Benchmark's manufacturing automation capabilities include robotic cells designed to product specialized alignment, calibration, liquid dispensing, laser marking, and repetitive assembly.



Robotics has also been implemented for test automation. This extends to inspection, product handling, assembly, safety handling, and other product and process requirements.

## Benchmark Is Your Test Solution

Benchmark is a leader in test strategy, development, quality, implementation, and automated solutions. [Contact Benchmark](#) today for a complimentary consultation and get started on improving your product quality and reliability.

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