No wires, big benefits

Agilent No-Wire Fixture Technology removes not just wiring but also many of the costs and complexities associated with short-wire and wireless in-circuit test (ICT) fixtures. It’s the fastest, most cost-effective approach to fixture development and a fundamental improvement in the way fixtures are designed, duplicated, modified and used. Compared to traditional fixtures, virtually every aspect of the fixturing process is improved.

- Superior test performance
- Improved test coverage
- Fewer fixture electronics
- Faster fixture turn-on
- Shorter lead times
- Lower fixture cost

Short-wire fixture on the left, No-Wire fixture on the right. A custom No-Wire PCB eliminates not just wiring but also many of the costs and headaches associated with debugging, duplicating, modifying, and using fixtures at in-circuit test.
Simply a better fixture

Agilent’s No-Wire Fixture Technology brings tangible improvements to every aspect of fixture development.

• Superior test performance. Wires are replaced with a custom No-Wire printed circuit board (PCB) using Agilent’s intelligent routing algorithms, so signal quality is improved, false calls are reduced, yields are increased at functional test, ground bounce problems are virtually eliminated, switching for edge-sensitive signals (clocks and resets) is cleaner, and accuracy is enhanced for low-value analog measurements.

• Better coverage. No-Wire fixtures never block resources, freeing up approximately 10 percent additional test system resources compared to short-wire fixtures. Conflicts between personality pins and probe locations are eliminated. You get full use of node and channel capacity on the Agilent 3070.

• Faster turn-on. No-Wire PCBs are designed by Agilent and the fixtures are built by qualified Agilent No-Wire Partners. Fixtures arrive complete—including fixture electronics—so they’re ready to work immediately. Agilent’s No-Wire routing technology minimizes the need for debug by solving ground bounce problems, ensuring clean switching for edge-sensitive signals and enhancing the accuracy of low-value analog measurements.

• Shorter lead times. Agilent develops the No-Wire PCB at the same time an Agilent No-Wire Partner is building the fixture. This parallel design-build process results in shorter lead times for complex, high-density fixtures. The end result: faster time to volume, time to market and time to profit.

• Custom electronics. Custom electronics such as the TestJet Mux card can be integrated into the No-Wire Interface Modules so they become part of the Agilent 3070 Test System. This eliminates the expense and time required to install these types of electronics on every fixture. Standardized fixture electronics such as pull-up/pull-down resistors can be mounted directly on the No-Wire PCB with Agilent auto-place software. You get a complete fixture from Agilent No-Wire Partners.

• Lower fixture cost. The cost savings for high-volume duplicates can be dramatic: duplicate fixtures can be built and deployed quickly and less expensively, and No-Wire Fixture PCBs can be copied in unlimited quantities while providing identical test performance. Plus, No-Wire fixtures free-up test resources in ICT, extending the lifecycle of existing in-circuit test systems to minimize capital costs. And the custom electronics model for No-Wire Fixtures eliminates the need to install fixture electronics on every fixture, saving time and parts cost.

Intelligent routing, better signals

Agilent No-Wire technology combines intelligent signal routing algorithms (used to design No-Wire PCBs) and data from the test generators on the Agilent 3070 to produce a high-quality, high-performance fixture. Agilent engineers used firsthand knowledge of the Agilent 3070 to design the algorithms to ensure the most intelligent routing of analog and digital signals on the No-Wire PCB. The end result is a better test with reliable defect coverage, fewer false calls, and higher yields at functional test.

• Edge-sensitive signals (clocks and resets) are routed between integrated ground and power planes for enhanced digital signal quality.

• Ground bounce problems in boundary-scan test are virtually eliminated.

• Trace widths and spacing are automatically optimized for accurate low-value analog measurements.

• Capacitive-coupling is eliminated allowing Agilent 3070 per-pin programmability to result in sharper digital edges, faster slew rates and fewer false calls.

• No-Wire fixtures never block resources, so they free-up approximately 10 percent additional test system resources (including hybrid card grounds). You get full use of node and channel capacity on the Agilent 3070.
Improved fixture electronics model, easier ECOs

With No-Wire fixtures, custom electronics (such as the TestJet Mux card, clock dividers and switching relays) can be mounted in the No-Wire Interface Module, so they no longer need to be added to every fixture, saving days of time when the fixtures arrive. Standard fixture electronics such as pull-up/pull-down resistors (1206 parts) can be mounted directly on the No-Wire PCB using the Agilent auto-place feature in the No-Wire PCB Routing Algorithms. Development time is also accelerated because the No-Wire PCB file that is used to specify fixture electronics is developed once and can be reused as a template for building other No-Wire fixtures. And since No-Wire fixtures have no wire mass, access to the bottom of the board is simple. ECO pads on the No-Wire PCB provide easy top-and-bottom fixture access to make engineering change orders (ECOs) fast and easy. Even with major board revisions, most of the fixture can be reused by simply replacing the No-Wire PCB instead of scrapping the entire fixture.

Reliable contact, repeatable test

Agilent Deflection Analysis Software ensures that contact performance with No-Wire fixtures is identical to short-wire fixtures and significantly better than existing wireless fixtures. The software automatically finds the best location for mechanical fasteners and minimizes the number required. It quickly identifies the maximum point of deflection on the No-Wire PCB, adds a mechanical fastener at that location, and repeats the process until the maximum point of deflection is found to be negligible (<10 mil). Mechanical fasteners are placed to miss tester resources and existing probes, something that was not easily done in the past. This analysis takes only a few minutes. The result: zero contact problems due to fixture PCB flex, and solid, repeatable performance from fixture to fixture, from test to test.

Higher margins, faster ROI

No-Wire fixtures have a direct impact on profitability in electronics manufacturing. You can save money and compete more effectively with Agilent No-Wire Fixture Technology.

• No-Wire fixtures allow faster ramp to volume production across multiple production lines, which means faster product introductions and faster time-to-profit.
• Engineering costs are reduced since No-Wire fixtures require minimal debug, ECOs are faster and easier, and troubleshooting is simplified.
• Though the cost of duplicate fixtures is controlled by Agilent No-Wire Partners, the PCB cost and shorter build times of No-Wire fixtures open the door to significant savings, especially for high-volume applications.
• Capital equipment costs are minimized because No-Wire fixtures free up test resources, extending the lifecycle of existing in-circuit test systems.
• Reliable defect coverage means higher quality tests and higher quality of shipped products, so warranty costs are reduced and customer satisfaction and retention levels are improved.

Simply a better approach to fixture development

No wires, no wire mass, fewer headaches. Agilent No-Wire Fixture Technology represents a fundamental improvement in the way fixtures are designed, duplicated, modified and used. It’s viable, highly cost-effective technology that has been proven effective for OEMs and CEMs worldwide, and it’s available immediately through Agilent and our qualified No-Wire Partners. Please call your nearest Agilent representative to learn more.
When switching from traditional fixtures to No-Wire fixtures, Agilent customers cite “better digital signal performance, more stable tests and higher test coverage” resulting in faster release to production. Benchmark evaluations at Agilent confirm these observations.

In benchmark tests on the same device using the same test on the same test system, No-Wire fixture technology virtually eliminated ground bounce.