

Fixture System Selection Guide

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CheckSum system can be configured with a variety of test fixture systems to meet your product and production test requirements. From simple, easy to use manual stations like the TR-5-400-QC and TR-7-1000-QC to in-line test systems like the ILS or IPTE MFT-19 and the versatile 12KN with dual-level test probing you can choose the test fixture systems that meets your cost, volume and size requirements

Generally, one spring probe is used for each electrical network on the UUT. For example, there usually will be only one spring probe to UUT ground, even though it may go to a number of places on the UUT. For typical analog UUTs, this works out to about one probe per component. For typical digital UUTs, there generally are less probes than components.

To meet the wide variety of needs, CheckSum offers several types of fixture systems. Mechanical fixture kits are powered by the operator and no external power is necessary. Pneumatic fixtures are operated by standard compressed air. Vacuum fixturing use a vacuum pump to pull the UUT down onto the probes. CheckSum fixture systems combine the flexibility to accommodate a high percentage of UUTs with high reliability and low recurring costs.

The maximum board size and number of test points are two important characteristics of fixture systems. The table below and on the following page compare the attributes for the different fixture systems.

Fixture Type	Mode	Maximum Probes	Maximum Board Size (UUT)
Mechanical	TR-5-400-QC	400	300mm x 216mm (11.75 x 8.5in)
Vacuum	TR-3A	1500	533mm x 432mm (21 x 17in)
Vacuum	TR-3-CONSOLE	1500	533mm x 432mm (21 x 17in)
Pneumatic	TR-7-1000-QC	1000	406mm x 335mm (16 x 13.2in)
Pneumatic	ILS	3000	590mm x 380mm (23.2 x 14.9in)
Pneumatic	12KN	5200	610mm x 335mm (24 x 13.2in)
Electromechanical	IPTE MFT-19	1800	406mm x 335mm (23.2 x 14.9in)

† Depends on fixture interface capacity, probe spring-force, fixture pressure, resources, options, and other factors. Consult CheckSum for more details.



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The recurring costs are the lowest with the TR--5-400-QC fixture system due to the low cost fixture kits. The customization costs are highest for the TR-3-CONSOLE and TR-3A vacuum receiver system due to several factors. The cost of the custom gaskets, compensation plate springs, and the often-used vacuum seal-box positioned over the UUT/DUT increase the fixture cost.

If you plan to have many different fixtures for a wide variety of UUTs, the time and effort to change the test system cables to the fixture kit or receiver should not be overlooked. These fixture systems have standardized spring-probe interfaces to eliminate this operation.

The external resources for compressed air or vacuum affect the total cost. Depending on the type of vacuum pump, the costs vary from \$2,500 to \$3,500 for a vacuum system. Pressurized air systems are much less, using standard shop air, or a low-cost compressor. Vacuum systems tend to leak and this can be the cause of continuous annoying background noise.

The need to access the UUT during a test can affect your fixture decision. If the UUT has many switches, buttons, pots, or jumpers that must be actuated during a test, consider the limited access due to the top pressure plate for the mechanical and pneumatic systems. Openings can be machined in the top plate, however the vacuum systems, without seal-boxes, provide unlimited access.

The number of operator movements to load and unload the assembly on the fixture can affect the production throughput. It will also affect how long one operator can work at the station before becoming fatigued.

Fixture Type	Mechanical	Pneumatic / Electromechanical				Vacuum
Attribute	TR-5-400-QC	TR-7-1000-QC	12KN	ILS	IPTE MFT-19	TR-3A TR-3-CONSOLE
Operator Movements to load UUT	2	2	1	N/A	N/A	1-2*
Operator Movements to unload UUT	2	2	1	N/A	N/A	1-2*
System Cost	Very Low	Low	High	High	Highest	Medium
Recurring Cost	Low	Medium	Medium	Medium	Medium	High
Dual Level Probes	No	No	Yes	Yes	Yes	No
Quick-Change Interface	Yes	Yes	Yes	Yes	Yes	Yes
Well suited for top-probes	Yes	Yes	Yes	Yes	Yes	No
External Resources	None	Compressed Air				Vacuum
Access to UUT during testing	Cover over UUT requires machine openings to UUT access from top		No Access			Open Access
*Note: If a vacuum seal box is used, then two operator movements are required						

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The TR-5-400-QC Mechanical-Advantage Fixture System uses a fixture receiver in conjunction with low-cost removable fixture kits. The operator actuates a lever arm to provide the downward force. This fixturing system has low recurring costs and works well for UUTs with up to 400 probes. These systems use a Quick-Change interface that allows snap-in fixture kits with no cable changes.



TR-5-400-QC



TR-7-1000-QC

The TR-7-1000-QC Fixture System uses compressed air to press the UUT down onto the spring probes. The TR-7-1000-QC accommodates up to 1000 test points and uses low-cost kits for testing different UUTs. This fixture system works well for general-purpose fixturing. The TR-7-1000-QC is recommended when fixture kits must be changed frequently.

The 12KN Dual Level Long-Travel Fixture System uses compressed air to press the UUT down onto the spring probes. Dual level probing for ICT and isolated

Functional Tests is supported. The operator presses a single button to actuate the long-travel press. A safety light curtain ensures the operator cannot be injured by the lid movement. These systems accommodate up to 5200 test points and use a Quick-Change interface that allows the fixture kits to slide into position with no cable changes. Compatible with TR-7-1000-QC fixture kits.



12KN



ILS-3000

The ILS uses compressed air to press the UUT down onto the spring probes. Dual level probing for ICT and isolated Functional Tests is supported. These systems accommodate up to 2000 test points and use a Quick-Change interface that allows the fixture kits to slide into position with no cable changes.

The IPTE MFT-19 Dual Level Inline System uses an electromechanical mechanism to press the UUT down onto the spring probes. This system accommodates up to 1800 test points. A quick-change interface allows the fixture kits to slide into position with no cable changes.



IPTE-MFT-19

The TR-3A and TR-3-CONSOLE Fixture System can use vacuum or mechanical clamps to force the UUT down to compress the spring probes. This fixture



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system uses industry-standard GR-2270-style fixture kits. The CheckSum receiver allows fixtures to be quickly changed from one UUT type to another. Vacuum fixturing works well for high volume testing and when unlimited top access to the UUT is desired. The TR-3-CONSOLE system includes a short rack system.



TR-3A



TR-3-CONSOLE

