Reliable Fine Pitch Contacting of Rigid PCBAs and Flex Circuits

Adrian Bangerter[1], Brian Crisp[2]

[1]Microcontact AG

[2]Arrowhead Technical Sales

The problem of a lack of space for test points on contemporary product designs is more relevant than ever. The aim of the designer is to gain test access by placing as many test points as possible for maximum test coverage on a minimum substrate size. This often conflicts with existing test fixture hardware solutions, which do not allow this due to the size of the spring contact probes that are used.

A solution to this challenge is an advanced rigid needle adapter:

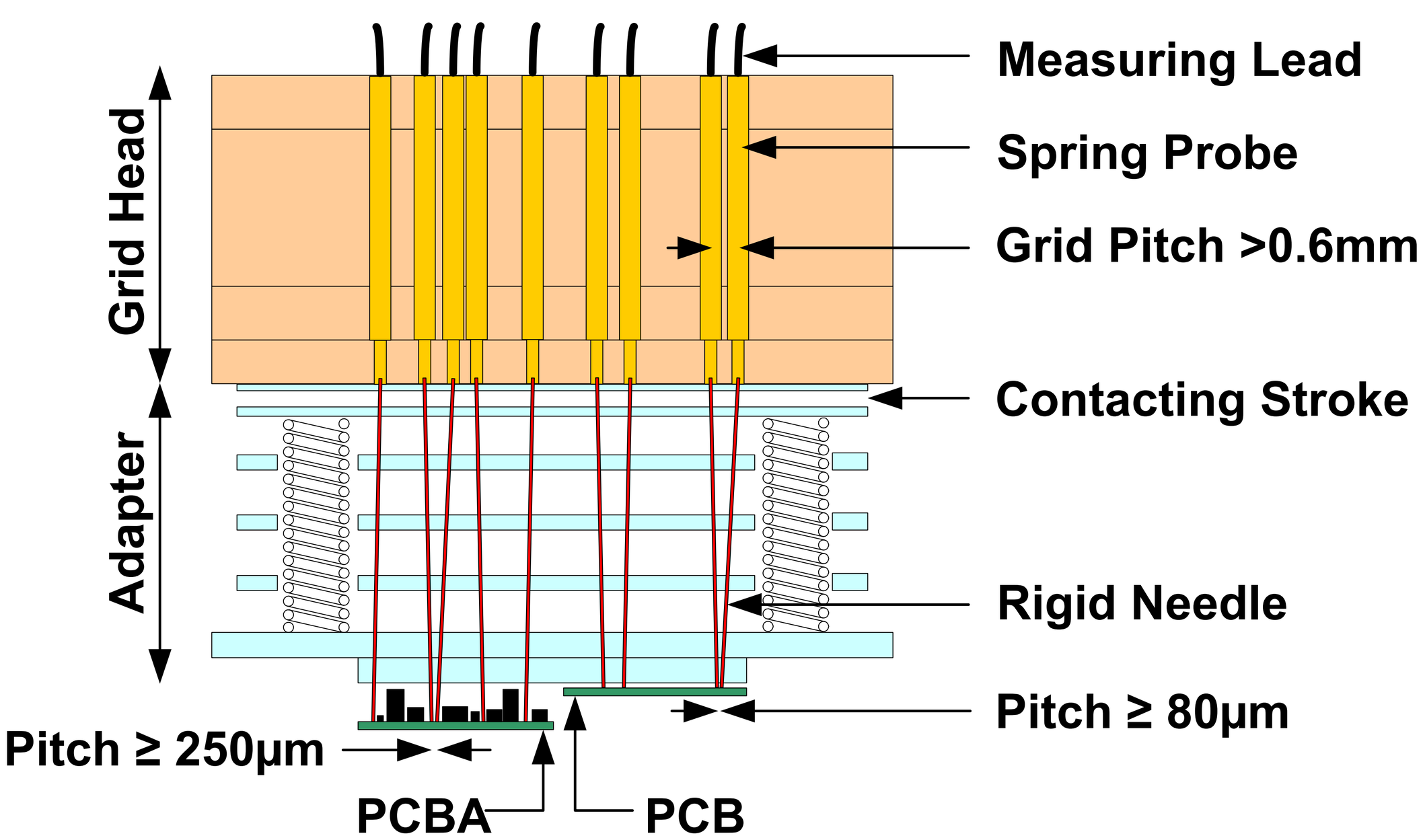


Figure 1 - Rigid Needle Adapter Architecture

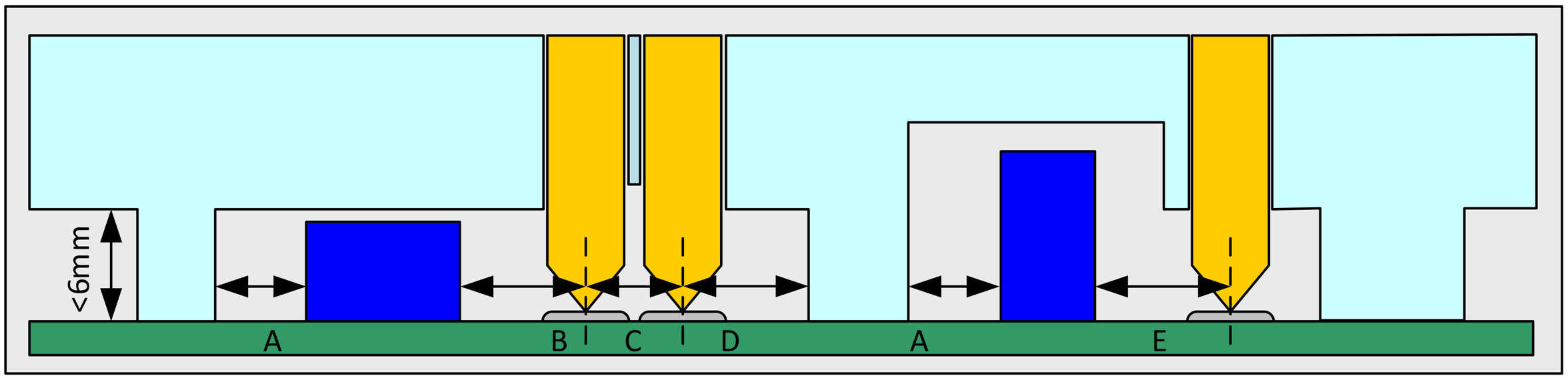
This rigid needle adapters enables 150,000 to 500,000 contacts without service, which greatly reduces maintenance costs and downtime compared to normal adapters.

This high-precision adapter technology enables in-circuit test, functional test and program flashing of test points as small as ø100 µm with a test point spacing of > 250 µm.

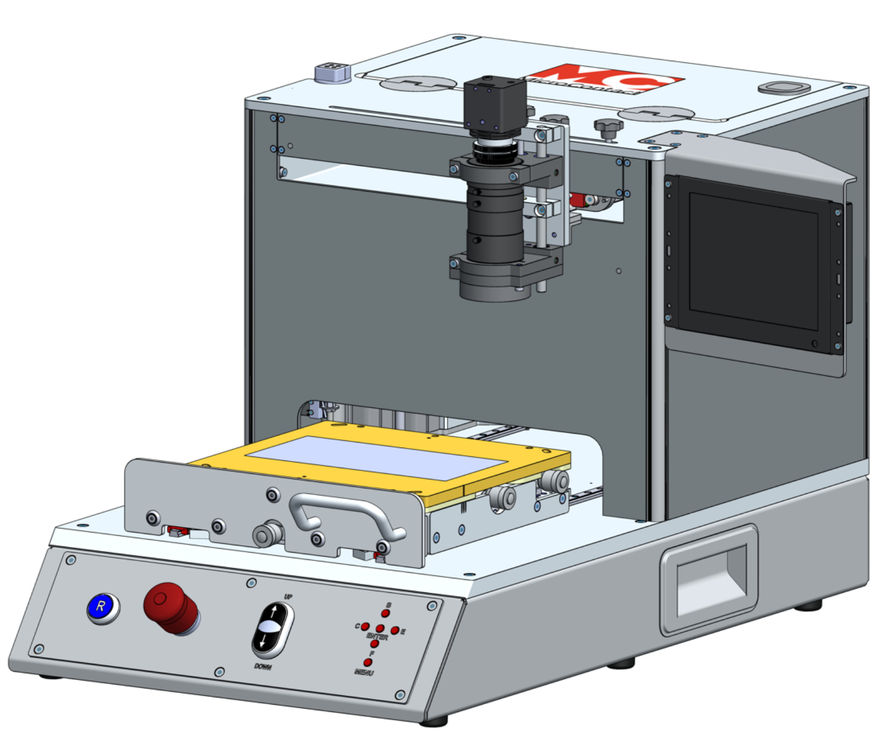
The advantage of this test solution for designers, for example, is that the test point spacing is reduced from 2 mm to 400 µm (16 mil), and 25X more test points can be placed on the same substrate area.

→ Finer pitch and test points near to components = less test area.

Position	Distance between	Minimal distance *
A	Support plate – component	0.5 mm / 20 mil
B	Component – rigid needle center	0.7 mm / 28 mil
C	Distance between two rigid needles	0.4 mm /16 mil
D	Rigid needle center - support plate	0.7 mm / 28 mil
E	High component – rigid needle center	0.9 mm / 36 mil



To achieve maximum contact accuracy, the PCBAs are optically aligned. This can be achieved in small hand-held test stations and also, in large inline systems.



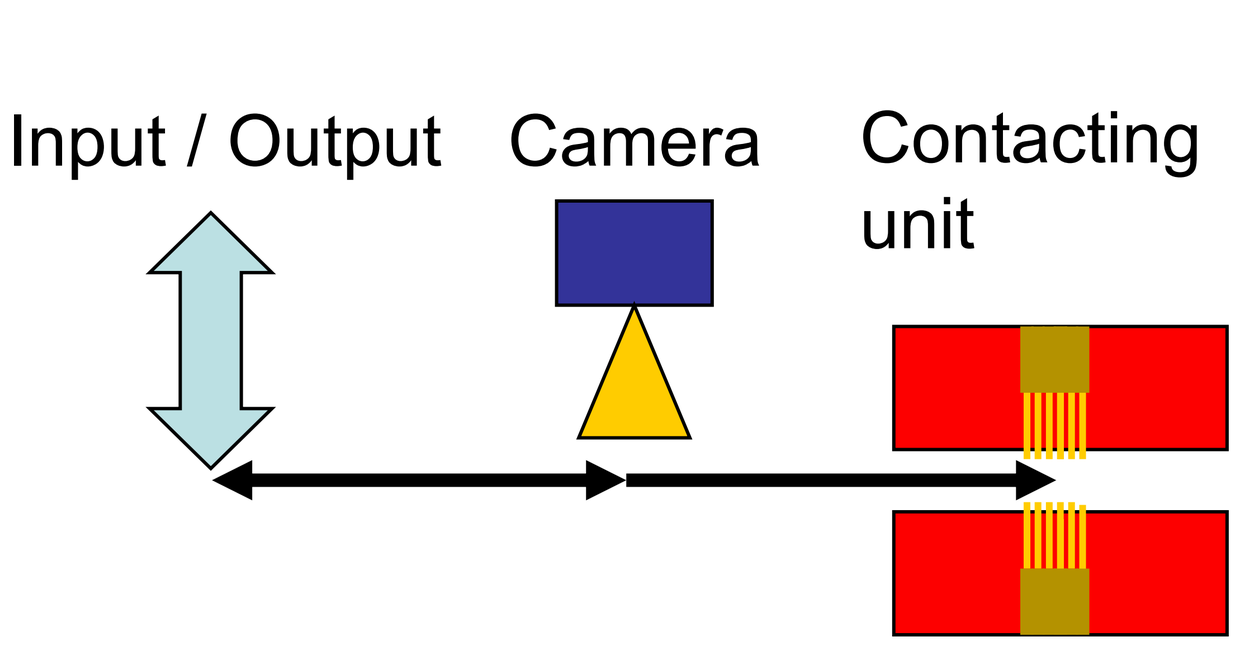


Figure 2 - Manual Optical Alignment System

Coupling this adapter technology, with fixtures and testers which incorporate a unique contacting method that is divided into a feed stroke and a contacting stroke provides optimal UUT/DUT protection. With this approach, there is the advantage for double-sided contacting of the substrate which is first well supported from both sides before the contacting force is applied. As a result, the load caused by the actuation of the test interface can be reduced to a minimum.

With a **standard adapter**, the contacting forces apply before push rods support the PCBA.

The **rigid needle adapter** supports first the PCBA. The contacting force is applied in a second stroke.

This two-stroke system provides the best possible PCBA support and reduces the micro strain to the minimum.

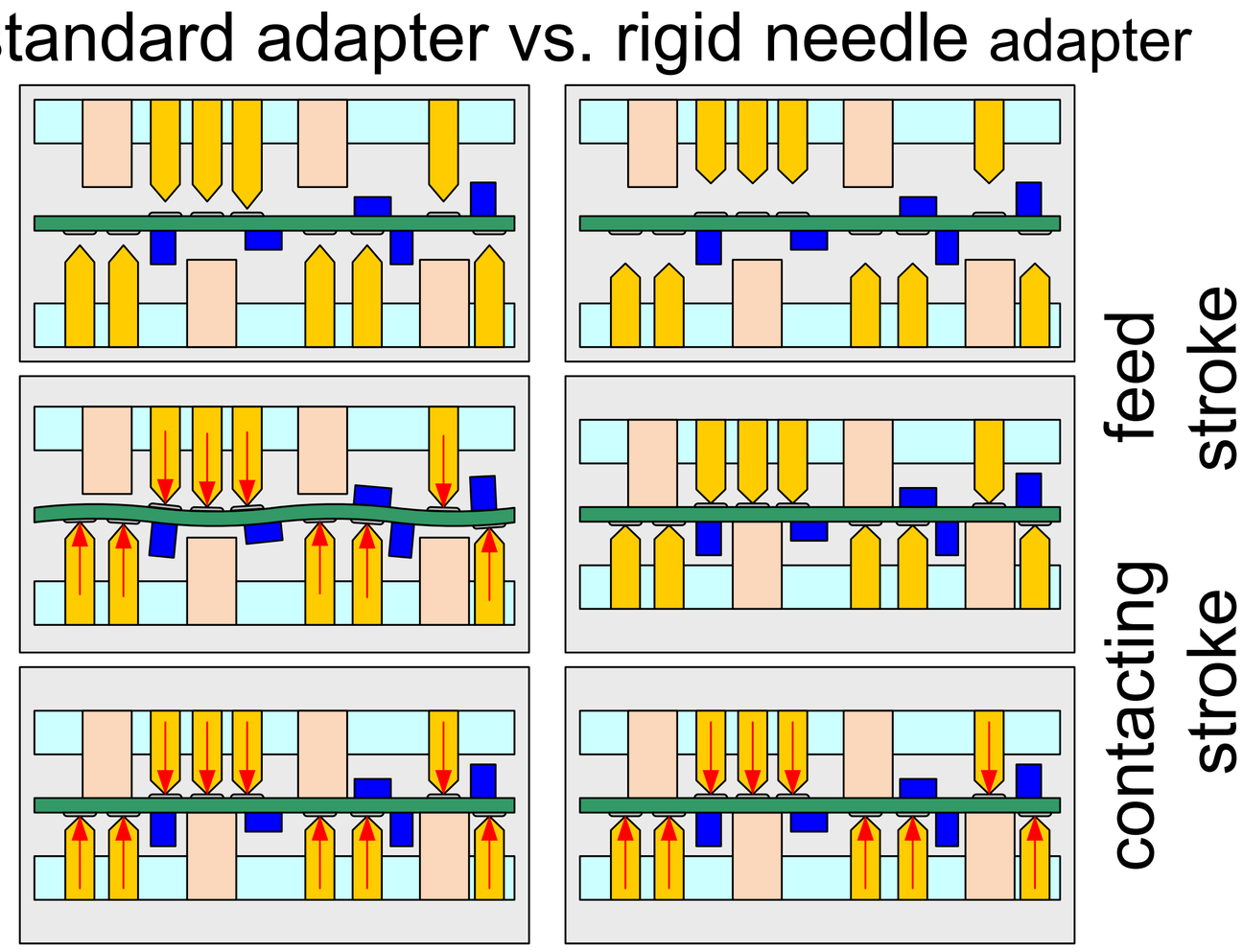
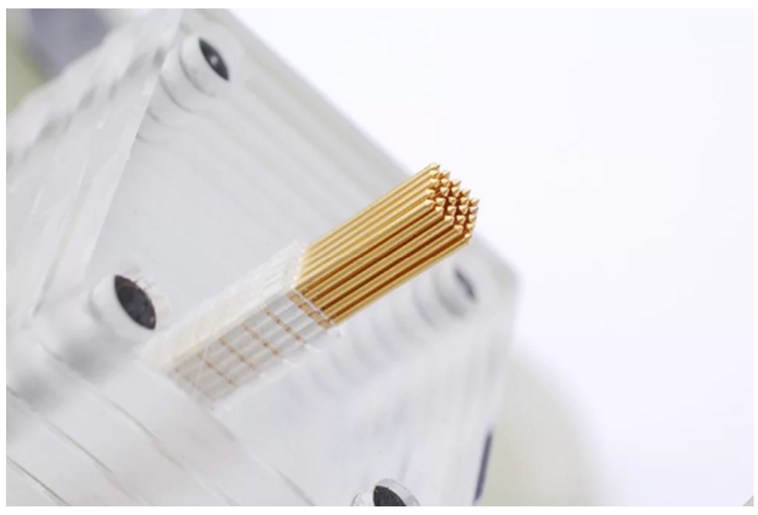


Figure 3 - Post Actuation Contacting

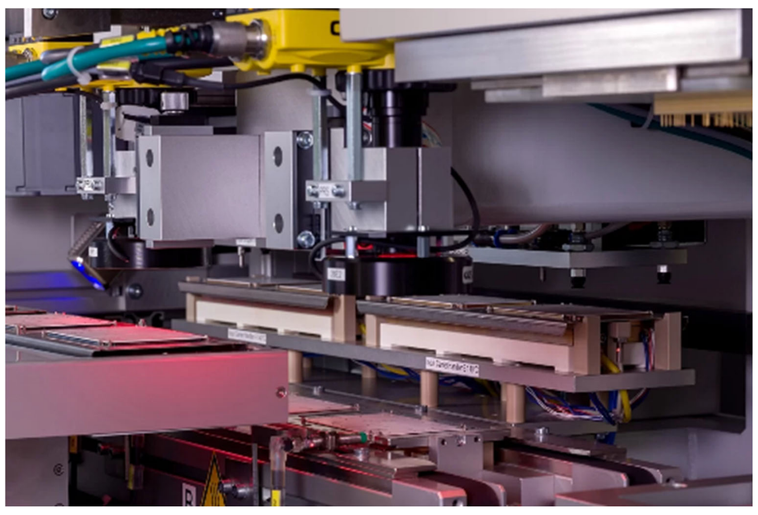
Conclusion

In summary, coupling rigid needle fixtures and test automation systems, provides improved accuracy and the possibility to reduce the needed test area on the PCBA. Additionally, the mean time between maintenance cycles and contact failure can dramatically improve.



Fine-Pitch Test Adapter

World leader contacting fine structures



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