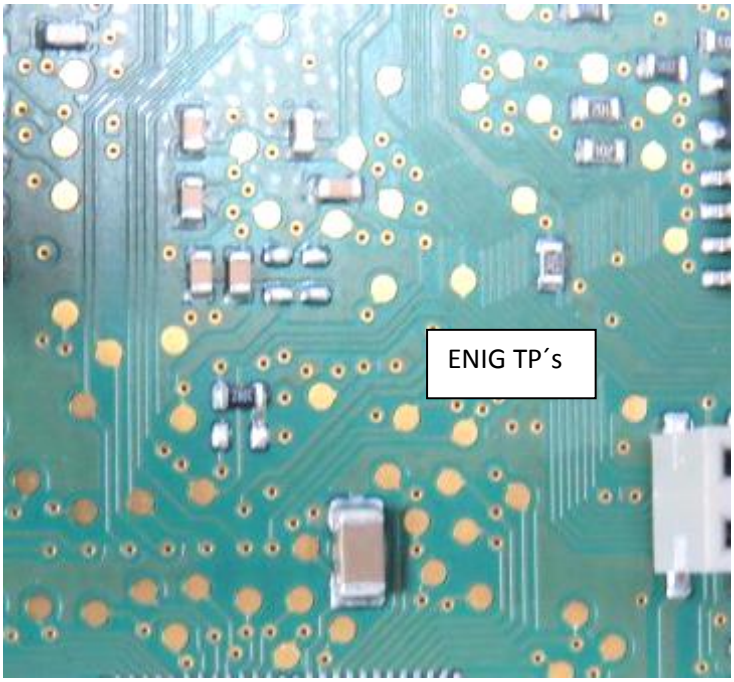
Guidelines for PCB design (for test)

There are certain rules when it comes to designing a new PCB, which would be good to implement in a new PCB. Below it will be explained how to design the print board, so the test fixture is as cheap as possible and as reliable as possible.

Mechanical Considerations for testpoints:

Ideally, all testpoints (TP) would be tested with the standard POGO 25 (ECT) spring probes (pitch 2,54mm). These low-cost and reliable probes are designed to have a pitch of min. 2,54mm between them, and are the perfect size for both test and manufacturing. If it is not possible to have the luxury of 2,54mm spacing, it is possible to go as low as 1,27mm pitch. Note that as the probe size decreases, the cost increases for both the probes but also the manufacturing of the fixture, but also obtaining high reliability becomes more challenging.

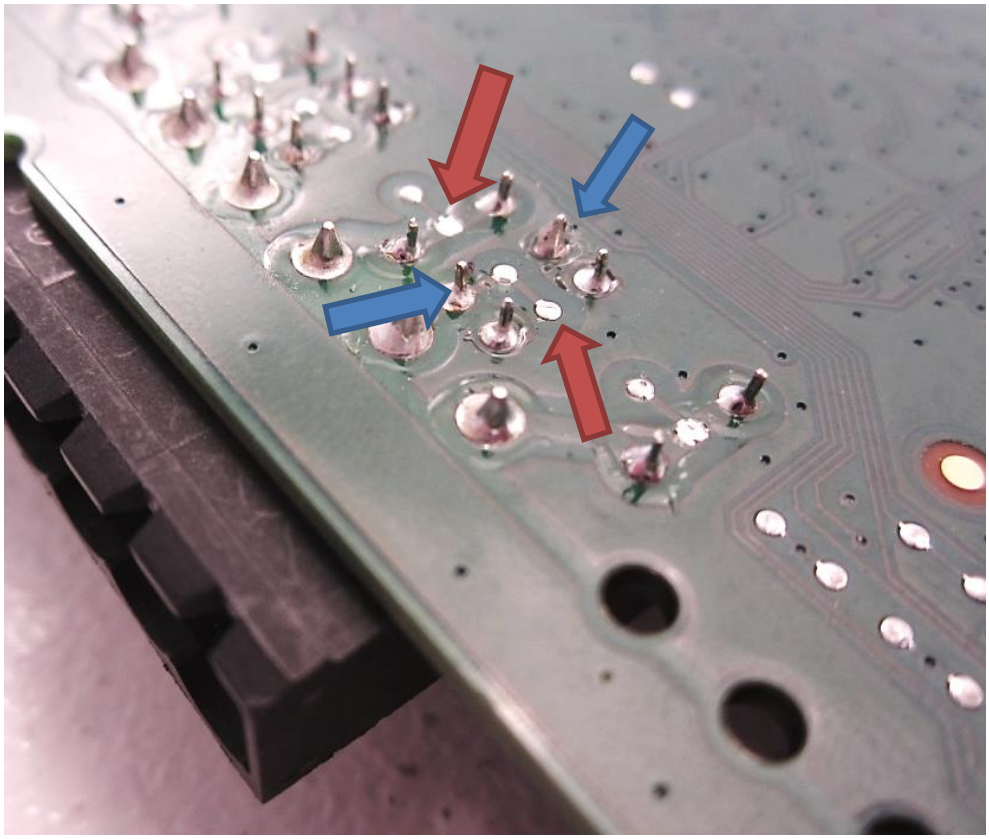
The size of the TP is also crucial for a reliable testfixture. If it is possible, then as big as possible, but the most standard size for a TP is Ø1,2mm. The smallest size of a TP is Ø0,8mm it should be no less than Ø0,8mm. If it gets smaller it is not possible to guarantee the probe will hit the TP, and it makes the fixture more expensive.



The material of the TP can vary from ENIG (Electroless Nickel Immersion Gold), component pin, and HASL (Hot Air Soldering Leveling). We recommend using the ENIG, because it has the best oxidation resistance. Because the

ENIG does not oxidate as much as other TP surfaces, it does not have a hard surface to penetrate as the HASL for example has.
If the PCB has a lot of TP´s, it can be a challenge to make sure the printboard does not bend a little when testing. It will not be a problem if it is not ENIG, but we have to take some precautions when designing the fixture.

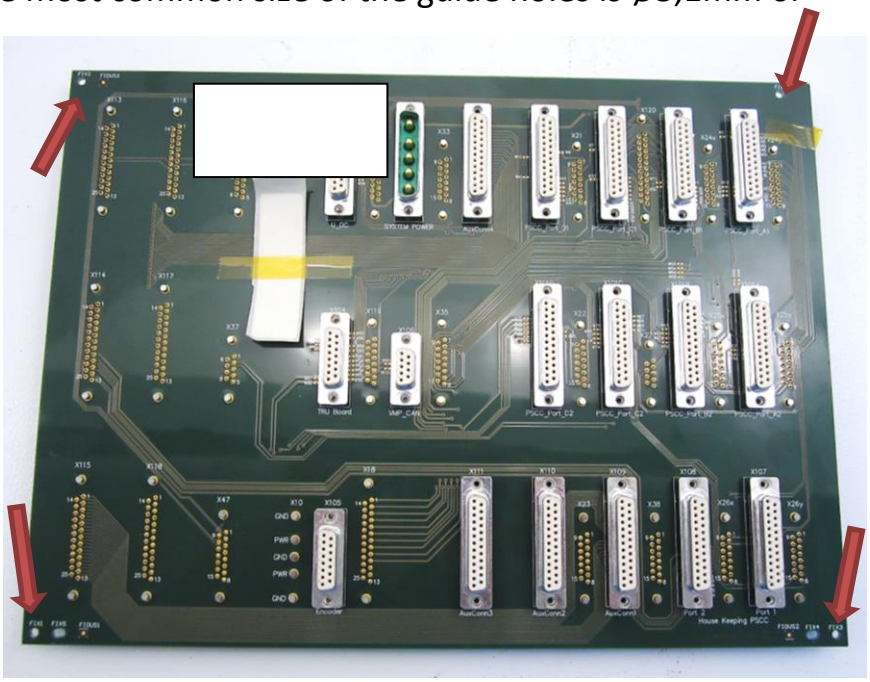
Good example of design for test.



In the picture you can see a great example of a PCB designed to make the test easier. The blue arrows indicate the component pins from the relay on the opposite side. And the red is the TP´s the designer has placed on the board. The PCB designer has made the 4 TP´s to prevent us from testing on component pins. Again it is not a problem to test on component pins, but it is more reliable to test on TP´s. In this case the TP´s is HASL.

Guide pins:

To achieve the best possible aligning of the PCB, 2 Guide holes has to be positioned in each opposite corners. The most common size of the guide holes is Ø3,1mm or Ø3,0mm holes.



In this picture there are a guide hole in each 4 corners, this is not common and is only our best case scenario.

Most common solution is to make 2 guide holes and make one of them rectangular to help aligning.

In some cases were the print has to be as small as possible, it is ok to keep the panel on and have the guide holes in the panel.