CLAIMS

1. A wafer probe station, comprising a probe station chamber comprising a chuck within the probe station chamber and a mounting plate capable of accepting a module selected from a plurality of different interchangeable modules, wherein the mounting plate is on a top surface of the wafer probe station and wherein each module is configured for interfacing at least one probe card with a wafer positioned on the chuck in the probe station chamber, wherein a module can be swapped for a different module and the mounting plate provides multiple ways for the wafer probe station to interface with a wafer by allowing different interchangeable modules to dock with the mounting plate when a module is positioned over the mounting plate, and wherein the plurality of different interchangeable modules comprises different types of modules including a probe positioner configured to align the at least one probe card with the wafer, an air-cooled rail assembly for supporting probe cards for testing multiple die on the wafer, and an adaptor for 4.5" or 6" probe cards, and wherein each type of module has a function that is different from functions of the other types of modules, wherein the mounting plate and each interchangeable module has mounting holes that are commonly sized and positioned for to allow for each module to be docked to the mounting plate using a fastener.

2. The wafer probe station of Claim 1, wherein the probe positioner can move the at least one probe card linearly along three X, Y, Z axes as well as rotationally about the Z axis.

3. The wafer probe station of Claim 2, wherein the probe positioner has an arm for positioning a probe card vertically above the wafer during testing of the wafer.

4. The wafer probe station of Claim 2, wherein the positioner is a magnetic or vacuum based positioner.

5. The wafer probe station of Claim 1, wherein the rail assembly can accommodate a plurality of individually adjustable probe heads.

6. The wafer probe station of Claim 5, wherein the rail assembly positions the probe card vertically above the wafer during testing of the wafer.

7. The wafer probe station of Claim 1, wherein the wafer probe station is capable of achieving accurate landings on a wafer at a temperature up to about 300° C in the wafer probe station, the wafer probe station further comprising:

an image processor for detecting and measuring spacing of a die the wafer; and

a database generated by detecting and measuring spacing of a die at predetermined temperatures and saving measured spacing for each predetermined temperature in the database to determine an amount of offset for each predetermined temperature.

8. The wafer probe station of Claim 1, further comprising a NIST traceable reference glass mask grid, wherein X and Y coordinates on the glass mask grid are calibrated to determine an accurate location for a contact pad to position probe needles on a contact pad on the wafer.

9. The wafer probe of Claim 7, wherein the X and Y coordinates are calibrated by gathering information for data points on the wafer to determine an offset, wherein the offset is a difference between where the contact pad is supposed to be and where it actually has moved due to temperature change or chuck movement, and correcting for the offset determined.

10. A semi-automatic wafer probe station, comprising:

an interface capable of accepting a module selected from a plurality of different interchangeable modules, wherein each module is configured for interfacing at least one probe card with a wafer, wherein a module can be swapped for a different module;

a chuck; and

a rotating arm comprising a first segment and a second segment to directly support the wafer, wherein the wafer is supported by both the first segment and the second segment, and wherein the arm is configured to rotate and pivot out of an opening in a front surface of the wafer probe station such that the first segment and the second segment are outside the wafer probe station to accept the wafer on a top surface of the first segment

and on a top surface of the second segment and the arm is also configured to rotate and pivot into the wafer probe station to load the wafer to a surface of the chuck such that the arm is completely within the wafer probe station, wherein the first segment and the second segment are configured to retract away from the wafer and the chuck after loading the wafer to the surface of the chuck, and wherein the first segment and the second segment rotate about a first end of the rotating arm away from one another when the first segment and the second segment retract away from the wafer and the chuck.

11. The wafer probe station of Claim 10, wherein the first segment and the second segment are movable between a position inside the chamber and a position at least partially outside the chamber.

12. The wafer probe station of Claim 11, wherein the chuck is movable between a test position of the chuck and a loading position of the chuck.

13. The wafer probe station of Claim 12, wherein the test position of the chuck and the loading position of the chuck are within the chamber.

14. The wafer probe station of Claim 11, wherein the first segment and the second segment are movable to a position at least partially out of an opening in a front face of the wafer probe station.

15. The wafer probe station of Claim 14, further comprising a door that opens to expose the opening in the front face of the wafer probe station.