



SEMICONDUCTOR INDUSTRY

ATE CALIBRATION ROBOTICS

Owens Design has shipped over 200 calibration units since we introduced our first R-Theta robot in 1993. The design is customized for each tester's requirements and privately labeled with our customer's logo.

The probe type and signal cable are application specific for all our ATE calibration robots. Probe type considerations include performance, mechanical integration, compliance and grounding. Signal cable considerations include performance, length, flexibility, and rated dynamic life.

A special load board is typically used within the probe contact area and is created based on pad size, pad layouts, registration locations and signal ground locations. Advanced applications allow for multiple probes, directly probing to signal pogo pins and directly probing the socket.

The robot control software may run on either a custom or PC-104 board controller. The communication interface is typically serial, but may be customized if needed. High-level commands are then passed

through to the robot. Our standalone diagnostic software is PC-based and is used to simplify troubleshooting.

Technology Platforms

R-Theta: Major features of the R-Theta platform include a maximum probe area of 12.5" in diameter, an accuracy rating of +/- 0.015" and a very stiff structure. This system self-registers to the load board and supports multiple probe types. The self-contained platform also has the advantage of being small and very portable.

X-Y: The major features of this high-speed platform include a probe area of 12"x12" X-Y and an accuracy rating of +/- 0.012". This platform is also small and easily portable.

High Accuracy: This platform has a probe area of 16"x22" X-Y and an accuracy rating of +/- 0.005". With its expandable probe area and multi-probe capability, this system is our most accurate calibration robot.



R-Theta Platform



X-Y Platform



High Accuracy X-Y Platform



ATE CALIBRATION ROBOTICS:

R-THETA



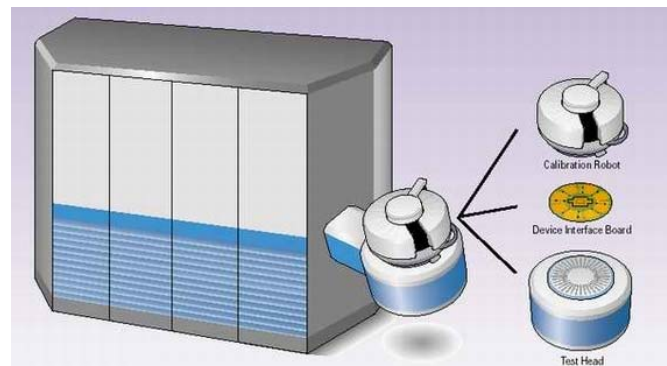
As ATE pin counts increase and timing requirements become more stringent Validation and Focused Calibration are best performed by a Calibration Robot.

The Calibration robot is used in conjunction with an oscilloscope, TDR or TDM instrument to validate tester signal

performance or to perform a calibration at the test head. Commanded by the tester the robot automatically moves the probe tip to the desire DIB pad locations. The measured signal always travels though the same cable path to maximize signal repeatability. The low weight of the robot makes it portable and easy to use.

Robots are customized to interface with specific ATE models. Customization enables us to accommodate the different communication and mechanical interface requirements of the testers. A variety of probe types are supported.

- Resolution: 0.0025 inches radial; 0.075° theta
- Accuracy: ± 0.005 inches radial; ± 0.015 inches theta @ 6" radius
- Travel time: 1 second between adjacent pads
- Probe Area: 360 deg, 12.5" maximum diameter
- Registration: Self registers to load board
- Probe type- customizable: 50 ohm coaxial, Resistor divider, Active
- Active Weight: ~20 lbs
- Communications: Serial, parallel or GPIB



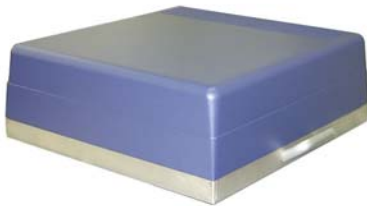


ATE CALIBRATION ROBOTICS:

X - Y



ATE System



Calibration Robot



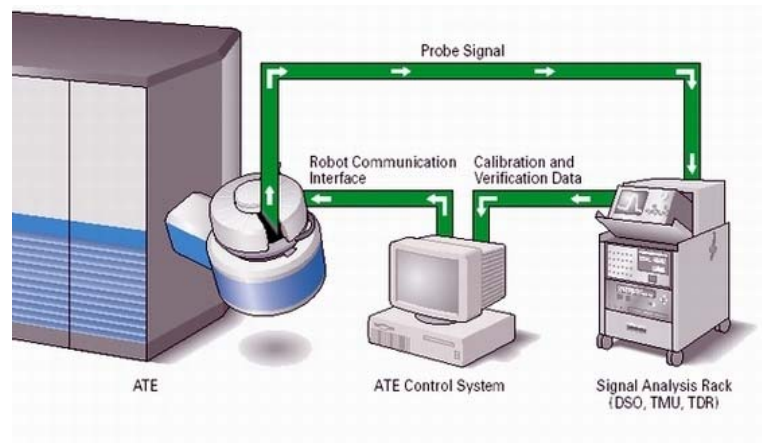
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TDR or TDM instrument to validate tester signal performance or to perform a calibration at the test head. Commanded by the tester the robot automatically moves the probe tip to the desired DIB pad locations. The measured signal always travels through the same cable path to maximize signal repeatability. Stepper motors and a custom drive keep the system electrically quiet while recording measurements.

Robots are customized to interface with specific ATE models. Customization enables us to accommodate the different communication and mechanical interface requirements of the testers. A variety of probe types are supported.

- Resolution: 0.0015" X and Y , 0.008" Z
- Accuracy: $\pm 0.012"$ X and Y , $\pm 0.016"$ Z
- Probe Area: 12" x 12"
- Registration: Self registers to load board
- Probe type: 50 ohm coaxial (customizable)
- Weight: 22 lbs
- Communications: Serial





ATE CALIBRATION ROBOTICS:

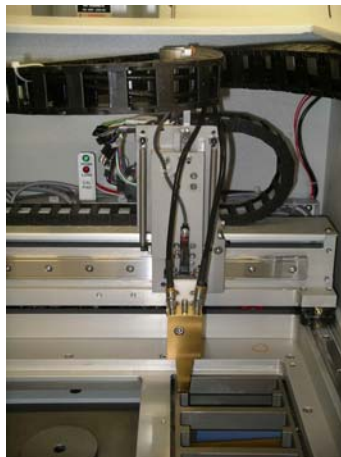
HIGH ACCURACY X-Y



High frequency measurements, high pin densities, and large test heads, demand a High Accuracy Calibration Robot.

The Calibration robot is used in conjunction with an oscilloscope, TDR or TDM instrument to validate tester signal performance or to perform a calibration at the test head. Commanded by the tester the robot automatically moves the probe tip to the desire DIB pad locations. The measured signal always travels though the same cable path to maximize signal repeatability. Stepper motors and a custom drive keep the system electrically quiet while recording measurements. A stiff structure and mapped lead screws insure a high positional accuracy of the probe.

Robots are customized to interface with specific ATE models. Customization enables us to accommodate the different communication and mechanical interface requirements of the testers. A variety of probe types are supported.



- Resolution: 0.0004" X and Y, 0.0025" Z
- Robot Accuracy: +/- 0.001" X and Y
- Probe Area: 16 x 22.5" or greater
- Registration: Self registers to load board or test head
- Probe type: Non-compliant; used for high frequency measurements
- Probe target: Board pad or tester pogo pin
- Weight: ~60 lbs
- Communications: USB or Serial
- Controls: PC-104, Separate control enclosure
- Temperature: Thermal Management