

WaferSense™ ALS2 Vertical Theory of Operation

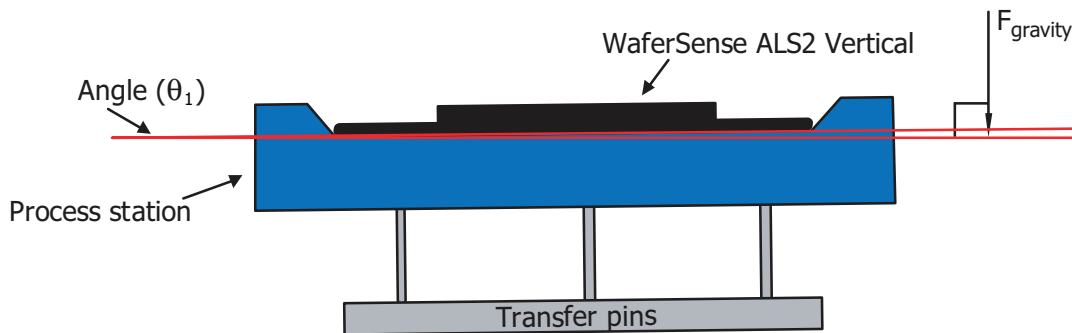
WaferSense ALS2 Vertical can be used to measure:

- Absolute level (to a plane perpendicular to earth's gravitational force)
- Parallelism between surfaces
- Vertical inclination of a surface

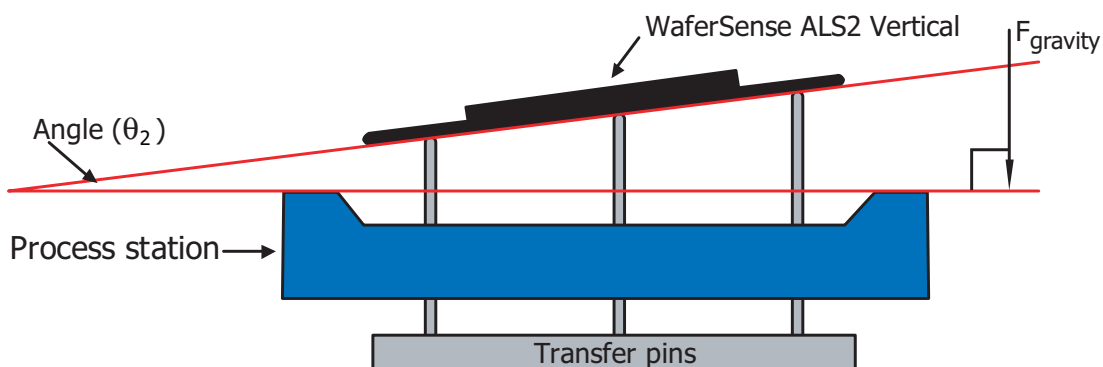
With its wafer-like design, ALS2 Vertical can be handled like a process wafer and can be placed anywhere a wafer can be placed. You can use ALS2 Vertical to easily measure the levelness and coplanarity of transfer and process stations, such as FOUPs, prealigners, robot end effectors, load locks, and process chambers.

A typical application for WaferSense ALS2 Vertical would be measuring the inclination of a process stage and the coplanarity of the lift pins and the process stage.

WaferSense ALS2 Vertical as used to measure absolute level of a process stage:



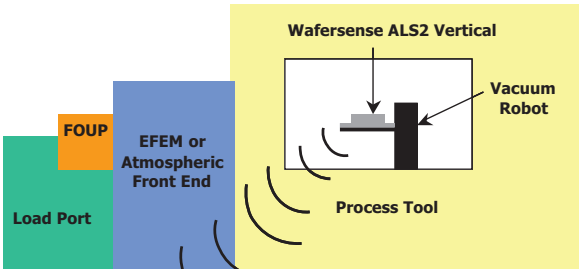
WaferSense ALS2 Vertical as used to measure the coplanarity of transfer pins to a process stage:



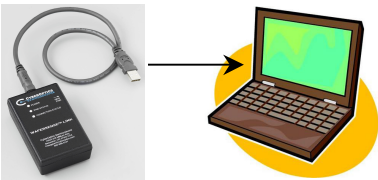
How WaferSense ALS2 Vertical Works ...



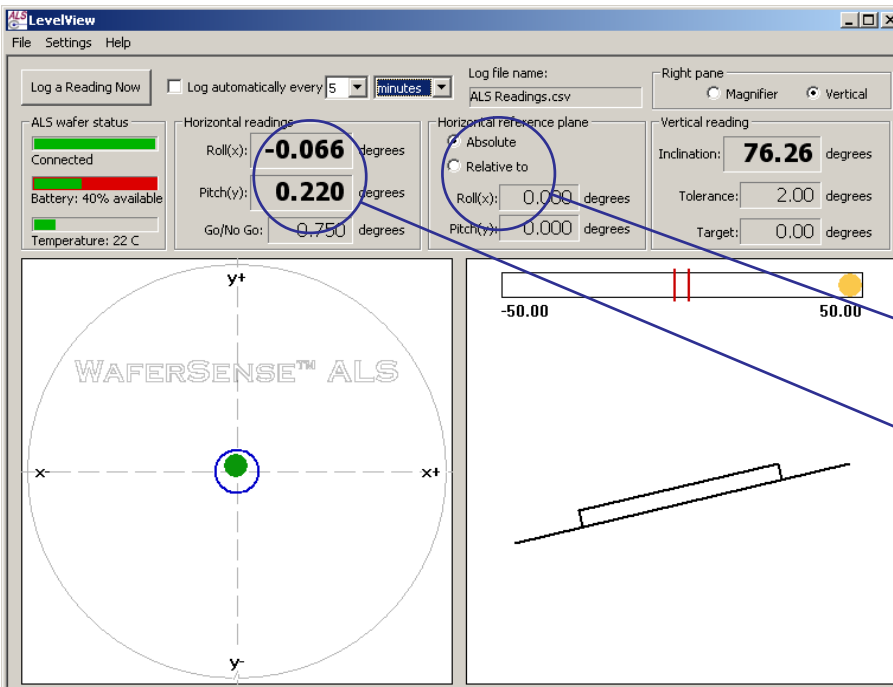
Leveling sensor: MEMS (microelectromechanical systems) inclinometers measure the inclination of orthogonal axes of the wafer with respect to Earth's gravity. Each bulk micro-machined MEMS device measures the differential capacitance of a moving proof mass placed between fixed electrode plates of opposite polarity. The capacitance changes in response to changes in inclination. The differential capacitance of the three electrodes is measured by an analog-to-digital converter. Proprietary technology is used to accurately convert the MEMS readings to inclinations.



Wireless communication: WaferSense ALS2 Vertical uses 2.4GHz RF (Bluetooth) wireless communication between the sensor and the link, which is connected to a PC. WaferSense ALS2 Vertical uses a Class 1 Bluetooth device, rated for unimpeded communication up to 100 meters.



Link & Laptop: The link is a compact USB 1.1 compliant device that connects to a laptop or PC to enable wireless communication with the sensor.



LevelView™ Software

Application: LevelView displays numeric pitch and roll measurements and an intuitive “level bubble” in real time. LevelView may be used to define Go/No Go regions and log data and notes for future reference. Parametric readouts for battery life, sensor temperature, and connection status are also displayed.

- Set reference plane to absolute gravity or relative to another surface.
- Numeric results allow for accurate, repeatable leveling adjustment.

LevelReview™ Software

Application: LevelReview can be used to display the contents of data logged by LevelView.