mti instruments

A worldwide leader in precision measurement solutions

Non-contact
Thickness/Bow Measurement
Systems

PV SERIES

High-speed Thickness
Measurement System for
Photovoltaic Wafer Production

PV 1000 Measurement Module

Outstanding accuracy, repeatability and stability are the hallmarks of MTI Instruments' non-contact measurement systems. The new PV-1000 series brings our 40+ years of precision measurement experience to a line of products specifically for the photovoltaic industry. Ideal for both process development and production environments, the PV-1000 solar wafer measurement module fits anywhere on the production line. Its modular design offers expandability to meet your current and future measurement requirements.

The PV-1000 Advantage

Using MTII's exclusive Push/Pull capacitance probe technology, each PV-1000 module provides up to three pairs of probes for measurement of maximum, minimum and average thickness, as well as total thickness variation (TTV) and wafer bow. For applications requiring additional thickness channels, multiple PV-1000 modules can be chained together for unlimited line scans on the wafer.

Wafer saw mark detection and classification is accomplished by adding optional laser sensors to the PV-1000 module. Utilizing up to two of MTII's industry leading Microtrak – SA standalone laser heads, saw marks can be classified for orientation and depth simultaneously with wafer thickness scanning making the PV-1000 ideal for incoming wafer characterization and sorting.

Integrated data acquisition and control electronics analyze and transmit wafer data via the on-board Ethernet port at speeds of up to five wafers per second. The digital I/O port allows communication with wafer handling equipment for up to 64 classes of wafer sorting and binning. Remote monitoring capabilities allow you to see your production line data across your network or directly at the module.

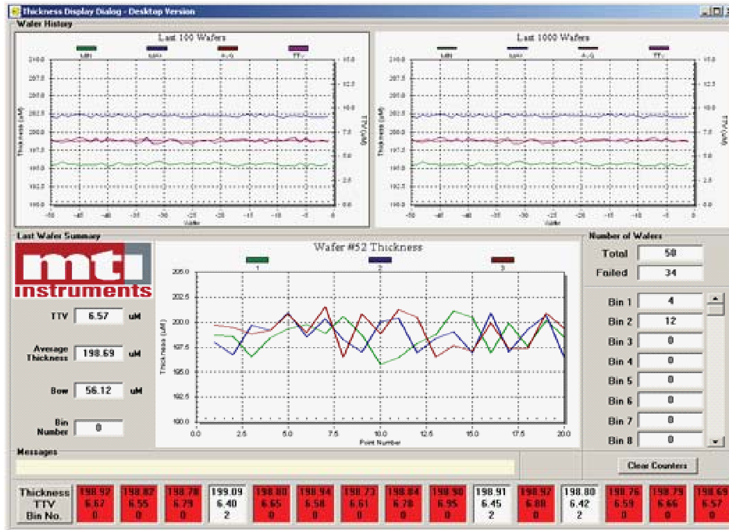
Complete System Integration

Each PV-1000 module comes with a complete software package for easy integration into your existing production line. Our Windows® based interface package allows for quick set-up, calibration and data monitoring at the module or across your Ethernet network. Multiple PV-1000 modules can be monitored from a single location using standard TCP/IP protocols.

For users who want to integrate the PV-1000 into an existing control computer, MTII also supplies a Windows® DLL software package standard with each system. The DLL allows access to every function and measurement performed by the PV-1000.

In addition to our standard PV-1000 module, MTII can design a custom solution for your exact requirements. From custom probe designs to complete software integration, our experienced engineers can assist in every aspect of your application. Contact MTII today and discover how you can benefit from the most accurate, reliable and cost effective solar wafer measurement system available.

System Features



MTII's Windows® based software control program allows you to view your production data live at the module or across your Ethernet network

Features

- Up to three thickness channels per rack
- Exclusive MTII Push/Pull capacitance probes work with all wafer types
- Minimum, maximum, average and total thickness variation measurements
- Bow measurement (3 probe pairs required)
- Optional laser sensors for wire saw orientation and depth monitoring
- Integrated data acquisition and control electronics
- Fast Ethernet communications port for production rates up to 5 wafer per second
- Scaleable for increased number of thickness line scans
- Digital I/O for interface with existing wafer handling equipment
- Windows® based control program for local or remote data monitoring
- Windows® based DLL package for integration with existing control PC's
- Standard and custom probe sizes available

Specifications

- **Wafer Type:** Mono or poly-crystalline silicon
- **Surfaces:** As-cut, lapped, etched, SiN layer
- **Power Requirements:** 100/240 VAC; 50/60 Hz; 50 Watts
- **Interface:** Ethernet
- **Data Output:** TCP/IP
- **Data Triggering:** Automatic
- **Rack Dimensions:** 455 x 175 x 125 mm. (LxWxH)

Thickness Measurement

	Probe 70-ILA	Probe 100-ILA
Measurement Technique	Capacitance	Capacitance
Measurement Range	1.7 mm	2.5 mm
Measurement Accuracy	+/- 0.25 µm	+/- 0.75 µm
Repeatability	0.05 µm	0.10 µm
Distance Between Sensors	3.4 mm	5.0 mm
Measurement Spot Size	8.0 mm	12.0 mm
Probe Length	10 cm	10 cm

Saw Mark Measurement

- **Measurement Technique:** Laser
- **Wavelength:** 670 nm
- **Standoff Distance:** 25 mm
- **Laser Angle:** 45 degree
- **Laser Dimensions:** 76 x 75 x 25 mm (L x W x H)
- **Laser Detector:** CMOS technology
- **Measurement Range:** 2.0 mm
- **Spot Size:** 15 µm
- **Frequency Response:** 20 kHz max.
- **Mark Detection Limit:** 2 µm depth
- **Cable Length:** As required
- **Selectable Filter Settings**