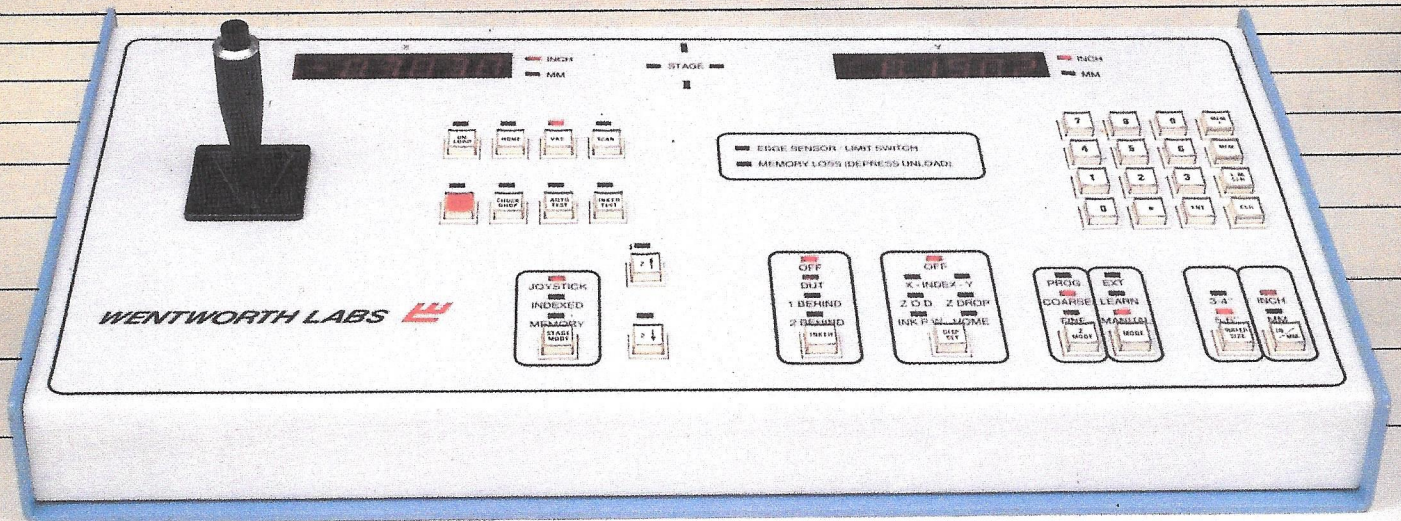
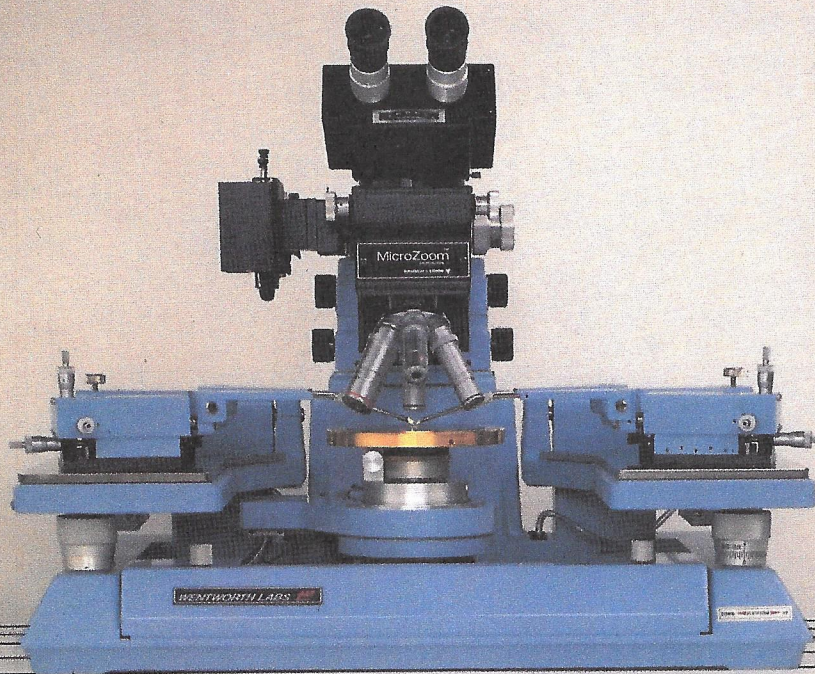


# The Driving Force

...IN PROGRAMMABLE ANALYTICAL PROBERS



## MP-1100 SERIES

WITH AccuTrak<sup>®</sup> CALIBRATION SYSTEM.

WENTWORTH LABORATORIES  INC.

# MP-1100 SERIES

## PROGRAMMABLE ANALYTICAL PROBERS

### ALL MODELS WITH AccuTrak® CALIBRATION.

The MP-1100 probers are designed for use as semiautomatic probers and as programmable failure analysis stations for probing sub-micron geometries. These precise, microanalytical probe systems are provided with **AccuTrak®** calibration and are capable of handling both packaged devices and wafers up to 6" (150 millimeters) in diameter.

#### AccuTrak® CALIBRATION:

The unique **AccuTrak®** calibration system provides accuracy directly at the wafer level to ensure the ultimate in precision probing. Straightness and squareness (not corrected for in glass-scale, closed-loop feedback systems) are guaranteed by the **AccuTrak®** system. **AccuTrak®** is the latest development in accuracy assurance calibration systems and is available only from Wentworth Laboratories.

#### LOCAL OR REMOTE CONTROL:

The separate joystick control console allows for instantaneous movement of all prober functions without having to enter a command on a computer keyboard. But, if desired, there is the option of controlling all functions via the RS-232C (supplied as standard), IEEE-488 or TTL logic interface.

#### TWO CONTACT METHODS:

Microanalytical probing is accomplished by means of either of two popular manipulator series: PR/PV-196M or PR/PV-201M. Standard "north/south" oriented probe card holders are available for 4 1/2" or 6" wide probe cards. The alternative choice of an "east/west" model facilitates the use of double ended probe cards. All probe card holders can be used simultaneously with manual probes.

#### EXPANDABILITY & FLEXIBILITY:

The MP-1100 probers can be expanded to handle a wide variety of probing tasks. Accessories which may be added include hot and cold chucks, dry and light-tight environmental chambers, HF ultrasonic cutter, coaxial probe kit, low capacitance probes, inkers, and adapters for packaged device probing.

#### CHOICE OF TWO BASIC MODELS:

HIGH SPEED (HS) MODEL & HIGH RESOLUTION (HR) MODEL

The choice of two basic models allows for designing a system to match specific probing applications. Discuss your requirements with the local Wentworth representative to determine which model suits your needs.

#### HIGH SPEED (HS) MODEL:

The high speed (HS) model offers a maximum chuck travel speed of 1.75"/sec (44.45 mm/sec) with a resolution of .25 mils (6.35  $\mu$ m) and an overall accuracy of  $\pm$  .25 mils (english) or 9.52  $\mu$ m (metric) over the full 6.25" (159mm) travel distance.

#### HIGH RESOLUTION (HR) MODEL:

The high resolution (HR) model has an overall accuracy of  $\pm$  .175 mils (english) or 5.71  $\mu$ m (metric) over the 6.25" travel distance and a resolution specification of .1 mils (2.5  $\mu$ m). The maximum chuck travel speed of the high resolution model is 0.7"/sec (17.78 mm/sec).

#### COMMON FEATURES:

- Stepper driven stage with **AccuTrak®** wafer level calibration.
- Wafer size up to 6" (150mm) in diameter.
- 2000+ learn mode memory locations with capability of 100 "home referenced" groups and 900 "position referenced" groups.
- RS-232C (standard), optional IEEE-488 or TTL logic interface.
- Programmable Z overdrive.
- Three inking modes (device under test, delayed inking one behind or two behind).
- Separate control console with tactile feedback pushbuttons and easy-to-use joystick.
- Fine X-Y controls for manual override.
- Programmable X & Y axes scan for rapid theta alignment.
- Programmable chuck unload position to facilitate device loading and unloading.
- Computer designed, rugged base casting for ultimate stability.
- Base unit weight of 165 lbs.
- Numeric LED display to indicate index size, set up parameters or stage position.
- Choice of **BAUSCH & LOMB** MicroZoom or Mitutoyo optics for high magnification with superior resolution and long working distances.

#### THE BASIC SYSTEM:

The cast aluminum base of the MP-1100 is the largest and most rugged we have ever built. The unique computer designed "honeycomb" construction with reinforcing plates ensures maximum stability, endurance and vibration attenuation.

All of the features of Wentworth's manual line of probers are standard in the MP-1100 series, including the proprietary tandem micrometer platform which provides the ability to apply a measurable amount of overdrive to the device under test. This is accomplished by raising or lowering the platform on which are located all probing devices, both input/output and analytical. The right-hand micrometer is graduated in 1/2 mil increments and operates simultaneously with the left-hand micrometer allowing proper "scrub" of the device under test. During this operation the device remains in focus through both the microscope and the closed circuit television system.

#### PLATFORM AND WAFER CHUCK STABILITY:

The probing platforms are supported in both the front and the back providing an extremely stable probing surface. The superior rigidity results in probing repeatability—the ability to disengage a probe tip or probe card and return to the exact same location.

The cast aluminum design with heavy steel top plates provides the weight necessary to counteract the upward forces of the probe card and probe tips.

An average, high density, 250 point probe card with 3 mils of overdrive will apply approximately 5.5 lbs. (2.5 Kg) of force on the wafer chuck. The chuck on the MP-1100 has been designed to withstand these elevated forces without deflection.

#### MICROSCOPE MOUNT:

The ability to scan the device under test is imperative when operating at high magnification with small fields of vision. The MP-1100 has a ruggedly constructed X-Y mount to provide 1 1/4" travel in the X direction and 3/4" travel in the Y.

#### OPTICS AND IMAGING:

The MP-1100 utilizes either the **BAUSCH & LOMB** MicroZoom or Mitutoyo FS-50 microscope. Both systems offer high magnification with excellent resolution and long working distances. CCTV and photomicrographic systems are available.

#### SOFTWARE CAPABILITIES:

As a stand-alone unit the MP-1100 is capable of storing 2,000+ sites in battery-backed memory storage. These sites can be stored in either of two distinct groups as programmed by the operator. Up to 100 "home referenced" groups can be stored which are referenced to the programmed home coordinates. A maximum of 900 "position referenced" groups are available to any or all "home referenced" groups.

A typical application would use a "home referenced" group for probing the die pattern of the entire wafer. Within each there may be any number of distinct patterns which may be probed by using any of the "position referenced" groups.

If desired the unit can be controlled via RS-232C (standard), IEEE-488 or TTL logic interface.

# ALL MODELS WITH AccuTrak® CALIBRATION

1120

## SPECIFICATIONS

FEATURE	HIGH SPEED	HIGH RESOLUTION
<b>TOTAL STAGE TRAVEL</b> X&Y AXES	6.25" (159mm)	6.25" (159mm)
<b>TOTAL STAGE TRAVEL</b> Z AXIS	.50" (12.7mm)	.50" (12.7mm)
<b>TRAVEL SPEED</b> X&Y AXES		
FAST	1.75 "/sec (44.45mm/sec)	0.7 "/sec (17.78mm/sec)
MEDIUM FAST	.25 "/sec (6.35 mm/sec)	0.1 "/sec (2.54mm/sec)
MEDIUM	16 mils/sec (406.4µm/sec)	6.4 mils/sec (162.56µm/sec)
SLOW	1.0 mil/sec (25.4µm/sec)	0.4 mils/sec (10.16µm/sec)
<b>INDEXING RANGE</b>		
Programmable to (english):	.5 mil to 6" w/.5 mil resolution	.1 mil to 3" w/.1 mil resolution
Programmable to (metric):	1µm to 152.4mm with 1µm resolution	1µm to 76.2mm w/1µm resolution
<b>ACCURACY</b> (includes straightness and squareness of axes)		
(english indexing):	± .25 mils over 6.25" travel	± 0.175 mils over 6.25" travel
(metric indexing):	± 9.52µm over 159mm travel	± 5.71µm over 159mm travel
<b>REPEATABILITY</b>	0.2 mils (5.1µm)	0.1 mils (2.5µm)
<b>RESOLUTION</b>	0.25 mils (6.35µm)	0.1 mils (2.5µm)

## COMMON SPECIFICATIONS

<b>DIMENSIONS AND WEIGHT</b>		
<b>BASE UNIT</b>	HEIGHT -22.25" (565.15mm) WIDTH -26.75" (679.45mm) DEPTH -17.56" (446.02mm) WEIGHT -165 lbs (74.8kg)	<b>INTERFACE CAPABILITY</b> RS-232C supplied with every machine. IEEE-488 or TTL logic interface options.
<b>CONTROL CONSOLE</b>	HEIGHT -5.75" (146mm) WIDTH -17.5" (445mm) DEPTH -9.5" (241mm) WEIGHT -4 lbs (1.8kg)	<b>POWER REQUIREMENTS</b> 120 Vac, 60Hz or 220 Vac, 50 Hz
<b>POWER SUPPLY</b>	HEIGHT -8.25" (209mm) WIDTH -20" (508mm) DEPTH -19" (483mm) WEIGHT -40 lbs (18.1kg)	<b>MANUAL PROBE PLATFORM MICROMETER LIFT</b> FINE: From zero (0) position COARSE: Clockwise Rotation to lower platform 5 mils Counter Clockwise Rotation to raise platform 8 mils .125" (3.175mm)
<b>MEMORY CAPABILITY</b> 2,000 + locations which can be stored in 100 "home referenced" groups and 900 "position referenced" groups.		<b>WAFER CHUCK</b> Aluminum with gold over nickel plating <b>STANDARD SIZE:</b> 6.25" (159mm) Diameter for 3" to 6" (76.2mm to 150mm) wafer <b>OPTIONAL SIZE:</b> 4.12" (105mm) Diameter for 1" to 4" (25.4mm to 102mm) wafer <b>FLATNESS:</b> < .0015" (.09mm) over total chuck diameter
		<b>THETA</b> Manual 120:1 ratio, 1 turn = 3°, total 20°
		<b>MICROSCOPE MOUNT</b> X TRAVEL 1.25" (31.75mm) Y TRAVEL .75" (19.05mm)

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

## ORDERING INFORMATION

Choose the model based on the following criteria:

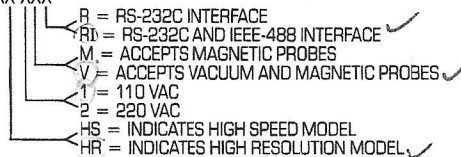
1. HIGH SPEED (HS) or HIGH RESOLUTION (HR).
2. Voltage requirement.
3. Capability of accepting magnetic or vacuum and magnetic probes.
4. Desired interface (RS-232C standard with every machine).

NOTE: All optics and accessories must be ordered separately. Consult your representative for part numbers, price information and assistance in ordering the MP-1100 System and accessories.

Your Local Representative Is:

## MODEL DESIGNATIONS

MODEL #	PART #	PROBE TYPE	INTERFACE
110 Vac, 60 Hz			
HIGH SPEED (HS)			
MP-1100-HS-1MR	0-037-1102	MAGNETIC	RS-232C
MP-1100-HS-1VR	0-037-1100	VACUUM	RS-232C
MP-1100-HS-1MRI	0-037-1106	MAGNETIC	RS-232C & IEEE-488
MP-1100-HS-1VRI	0-037-1104	VACUUM	RS-232C & IEEE-488
HIGH RESOLUTION (HR)			
MP-1100-HR-1MR	0-037-1110	MAGNETIC	RS-232C
MP-1100-HR-1VR	0-037-1108	VACUUM	RS-232C
MP-1100-HR-1MRI	0-037-1114	MAGNETIC	RS-232C & IEEE-488
MP-1100-HR-1VRI	0-037-1112	VACUUM	RS-232C & IEEE-488
220 Vac, 50 Hz			
HIGH SPEED (HS)			
MP-1100-HS-2MR	0-037-1103	MAGNETIC	RS-232C
MP-1100-HS-2VR	0-037-1101	VACUUM	RS-232C
MP-1100-HS-2MRI	0-037-1107	MAGNETIC	RS-232C & IEEE-488
MP-1100-HS-2VRI	0-037-1105	VACUUM	RS-232C & IEEE-488
HIGH RESOLUTION (HR)			
MP-1100-HR-2MR	0-037-1111	MAGNETIC	RS-232C
MP-1100-HR-2VR	0-037-1109	VACUUM	RS-232C
MP-1100-HR-2MRI	0-037-1115	MAGNETIC	RS-232C & IEEE-488
MP-1100-HR-2VRI	0-037-1113	VACUUM	RS-232C & IEEE-488
MP-1100-XX-XXX			



NOTE: Unless otherwise specified, all units will be shipped with the standard 6.25" (159mm) diameter wafer chuck.

**AccuTrak®**  
CALIBRATION STANDARD  
ON ALL MODELS.

# WENTWORTH LABORATORIES INC.

### WORLD HEADQUARTERS:

WENTWORTH LABORATORIES, INC.  
500 Federal Road  
Brookfield, CT 06804  
Tel: (203) 775-0448  
Tlx: 969-652

WENTWORTH LABORATORIES, INC.  
1046 Morse Avenue  
Sunnyvale, CA 94089  
Tel: (408) 745-4644

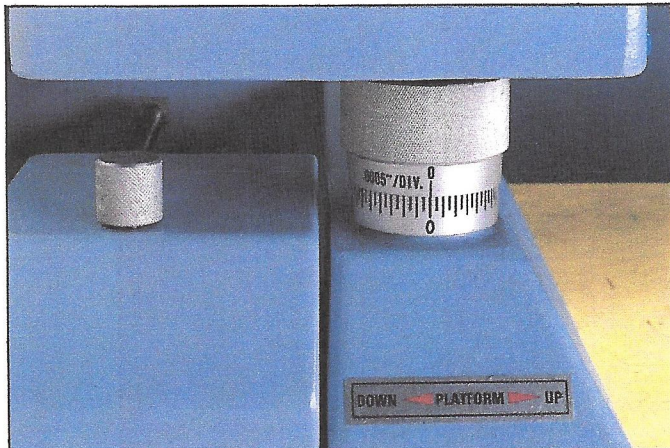
WENTWORTH LABORATORIES, LTD.  
Sunderland Road  
Sandy,  
Bedfordshire SG19 1RB, England  
Tel: (0767) 81221  
Tlx: 851-826-583

WENTWORTH LABORATORIES, GMBH  
Pettenkoferstrasse 20-22  
D-8000 Munchen 2, West Germany  
Tel: (089) 5309046  
Tlx: 841-521-6915

DB 11 1/86  
0-200-0036

919-1875  
Mr. Michael...

# ACCESSORIES



Probing platform is supported in back and front for maximum stability. Micrometer provides measurable "Z" overdrive control for either manual probing or automatic probing without an edge sensor.

## ANALYTICAL PROBES

There are several styles of probes available to meet every application. The MP-1100 can be equipped with manually operated vacuum or magnetic based probe assemblies.

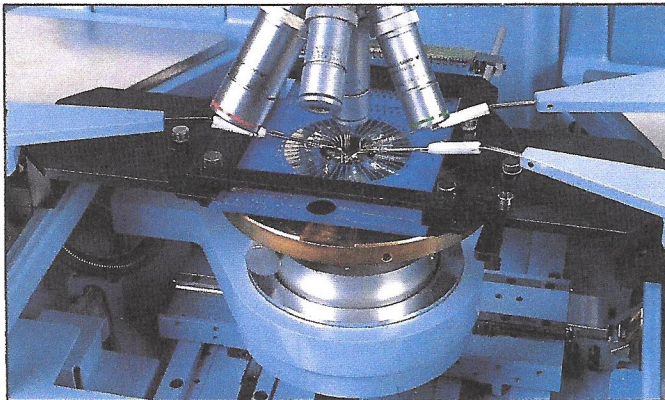
**PR/PV-196M SERIES**—available with standard 60 TPI or "SUPERPROBE" micrometers with 1250 TPI fine/50 TPI coarse axes controls.

**PR/PV-201M SERIES**—linear motion in all three axes. Also available in standard or "SUPERPROBE" models.

**LOW CAPACITANCE PROBE HEADS**—with extremely low input capacitance to maintain the fidelity of high impedance signals at high frequencies.

**COAXIAL PROBE HEADS**—with coaxial lines to within .10" (2.5 mm) of contact point.

**INKERS**—are available with disposable ink cartridges.



Analytical probes can be used simultaneously with probe cards.

## PROBE CARDS

Probe card holders are available for those applications requiring 4½" or 6" wide probe cards. Analytical probe heads can be used simultaneously with the cards.

## PR-191 PROBE PLATFORM

The PR-191 probe platform is designed for use with up to 20 PR-191 discrete probe head assemblies. This allows multiple geometries to be probed with minimum investment.

## TEST HEADS

Various test heads and handlers can be adapted for use on the MP-1100 probers.

## ULTRASONIC CUTTER

An Ultrasonic Cutter with "auto-tune" is available for passivation removal and isolation of circuits. Traces as small as 2  $\mu$ m can be cut.

## HOT AND COLD CHUCKS

Hot and cold chucks are available for characterizing wafers from -60°C up to 300°C. Environmental enclosures can be ordered to complete the system.

## PRE-WIRED TEST SOCKETS

Zero insertion force test sockets mounted on PC boards are available for standard packaged devices.

## CCTV AND STILL CAMERA SYSTEMS

Color and black & white closed-circuit television systems are available. Systems can be adapted to handle 35mm and Polaroid camera options.

## MICROSCOPES

**BAUSCH & LOMB**  MicroZoom®

- Photobinocular beam-splitting head
- 2.25X, 8X, 25X objectives (standard)
- 50X and .8X objectives (optional)
- 10X eyepieces (standard), 15X, 20X optional
- Quadruple nosepiece
- Course and fine focusing block
- 1:2 zoom

OBJECTIVES	STANDARD PACKAGE		OPTIONS	
		10X EYEPIECES	15X EYEPIECES	20X EYEPIECES
2.25X	Mag. Range Working Distance	22.5 - 45X 29.5 mm (1.16")	33.75 - 67.5X 29.5 mm (1.16")	45 - 90X 29.5 mm (1.16")
8X	Mag. Range Working Distance	80 - 160X 19.9 mm (.78")	120 - 240X 19.9 mm (.78")	160 - 320X 19.9 mm (.78")
25X	Mag. Range Working Distance	250 - 500X 12.9 mm (.51")	375 - 750X 12.9 mm (.51 mm)	500 - 1000X 12.9 mm (.51")
50X	Mag. Range Working Distance	500 - 1000X 12.5 mm (.49")	750 - 1500X 12.5 mm (.49")	1000 - 2000X 12.5 mm (.49")

Amplifier: The Amplifier (PN 31-30-14) will increase any of the above combinations by 1.00X, 1.25X and 1.50X.

## Mitutoyo FS-50

- Photobinocular beam-splitting head
- 2X, 5X, 10X, 20X, 50X objectives
- 10X, 15X or 20X eyepieces
- Quadruple nosepiece
- Course and fine focusing block
- 1:2 zoom
- Will use many accessories available for **BAUSCH & LOMB**  MicroZoom®

OBJECTIVES	STANDARD PACKAGE		OPTIONS	
		10X EYEPIECES	15X EYEPIECES	20X EYEPIECES
2X	Mag. Range Working Distance	20 - 40X 34 mm (1.34")	30 - 60X 34 mm (1.34")	40 - 80X 34 mm (1.34")
10X	Mag. Range Working Distance	100 - 200X 33 mm (1.30")	150 - 300X 33 mm (1.30")	200 - 400X 33 mm (1.30")
20X	Mag. Range Working Distance	200 - 400X 20 mm (.79")	300 - 600X 20 mm (.79")	400 - 800X 20 mm (.79")
5X	Mag. Range Working Distance	50 - 100X 32 mm (1.26")	75 - 150X 32 mm (1.26")	100 - 200X 32 mm (1.26")
50X	Mag. Range Working Distance	500 - 1000X 13 mm (.51")	750 - 1500X 13 mm (.51")	1000 - 2000X 13 mm (.51")