

UNIVERSAL  
MEASURING  
SYSTEM

# LABMASTER<sup>®</sup>

## AUTOMATIC

Model 1000A



**Pratt & Whitney<sup>®</sup>**  
Measurement Systems, Inc.

## The Standard of Accuracy

### Laser-Based

LABMASTER® Model 1000A is designed to provide the ultimate in user-friendly operation while delivering calibration-quality accuracy and reproducibility. Our exclusive digital interferometer measures internal and external dimensions by comparing the measurement probe position to the wavelength of a laser light source, effectively coupling the wavelength of light to the part being measured.

The thermal coefficient of expansion for this laser wavelength is more than ten times smaller than that of steel, making for a highly stable measurement source. Equally important, the linearity errors inherent in other scales (glass, steel, LVDT's) are absent in Pratt & Whitney's laser.

Because this wavelength of light is stable, linear, and has very high resolution, when compared to like instruments, LABMASTER® Model 1000A provides the most accurate means of linear dimension measurement available in the world. And that's not all.

To further minimize instrument error, precision force systems guide our exclusive bi-directional probes and associated optics along very accurate air-bearing slides. A large, variable-attitude work table accommodates a growing family of fixtures to precisely hold your gages and parts. GageCal™, our own Windows®-based control software simplifies data collection and speeds up data entry. Add our optional gage management module and the system is complete; with all subsystems complementing each other to deliver the accuracy of a comparator while offering the productivity associated with direct-reading instruments.

### Simple, Flexible and Fast

Our most automated ID/OD measuring system with a 40" (1016mm) direct reading range and an 80" (2032mm) capacity.

Features include laser interferometer, computer control, air bearings, bi-directional probes, constant measuring force, and flexible fixturing. These features offer guaranteed repeatability and operator independent reproducibility with unmatched speed. Swivel, centering, tilt, and elevation adjustments are controlled with a press of a button or click of the mouse.

For even more automated control, GageCal scripting allows the user to create a sequence of automated actions for complete automatic measurement of custom parts or gages. Automated positioning, alignment, and measurement practically eliminate operator influence and decrease measurement time.

Instrument configurations, including table alignment and position, can be saved and recalled at a later time, minimizing setup time for common artifacts. GageCal also has predefined application screens and enters tolerances for various types of measurements such as blocks, rings, plugs, and threads.

With appropriate accessories, the LABMASTER Model 1000A is capable of measuring rings (threaded & non-threaded), gage blocks, plugs (threaded & non-threaded), dial/test indicators, gage wires, micrometer heads, pin gages, tapered plugs (threaded & non-threaded), end standards, micrometers, and snap gages, all with NIST traceability.

The LABMASTER Model 1000A can also measure a wide range of specialty applications such as ID/OD bearings (radial/axial clearance), balls, shafts, optics, as well as your precision parts. Other specialty measuring applications include: gears, shafts, optics, film thickness, automotive parts, aerospace parts including aircraft engine parts, and your precision components can all be measured on the ULM.

### A Standard to Grow With

At Pratt & Whitney we're committed to an ongoing development program, that will produce a continuous stream of new or improved applications for the LABMASTER® product line. We're equally sensitive to the investment one makes in such an instrument. That's why we make all new developments reverse compatible to the very first LABMASTER® we shipped. So when you purchase a LABMASTER® today, be assured that your investment is safe. Because as your measurement needs evolve-and they will-your LABMASTER® and Pratt & Whitney will be there ready to accommodate your new measurement needs.

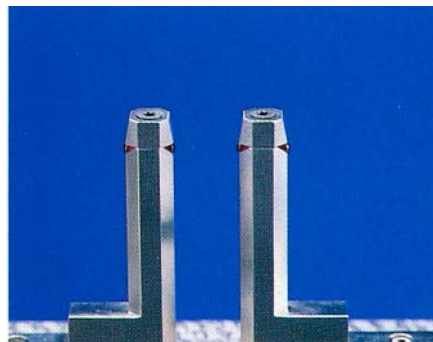
### Guaranteed Service

The LABMASTER® Model 1000A was designed with serviceability in mind. Our exclusive modular design facilitates problem isolation and field interchangeability. We offer a one-year warranty (longer available) and service personnel who receive factory training to provide you with experienced product support and calibration services meeting ISO 17025 standards.

We've built these instruments to exacting standards of accuracy and reproducibility to guarantee you years of high productivity, reliability, and product integrity. Our reputation, as well as yours, depends on it.



*Broad Application*



*Bi-directional Probes (U.S. Patent)*



*Optional Foot Switch*

## Features

### ■ Mechanical and Thermal Stability

Table “gantry” design minimizes measurement slide deflection. Laser beam stability and close optics-to-probe coupling minimize thermal error.

### ■ Modular Construction

USB technology and PC facilitate in-field serviceability.

### ■ Digital Laser Interferometer

The wavelength of laser light, universally accepted as the reference standard for all length measurements, guarantees maximum resolution, traceability, and performance.

### ■ Two Point Calibration

Allows LABMASTER® to be calibrated using two lab grade NIST traceable gage blocks/rings. This calibration takes less than one minute. One point calibration also possible through environmental calibration.

### ■ PC Control with our GageCal™ Software

WINDOWS™ based, mouse-driven control software with “Smart” spreadsheets reduces data entry, eliminates transcription errors and speeds up measurements. GageCal™ software allows the current reading display to be logged into any WINDOWS™ based program.

### ■ Large “Variable Attitude” Measuring Table

Integrated locating posts and T slots make part fixturing quick. Part alignment (swivel, centering, tilt and elevation) is automatic, minimizing operator influence. The table acts as a soakplate to ensure stable readings.

### ■ Bi-Directional Probes (U.S. Patent)

Eliminates time consuming set-up changes. Easily replaceable contact points mean no anvils to lap.

### ■ Air-Bearing Slides

Reduces friction, wear and tear.

### ■ Flexible Fixturing

A growing selection of fixtures ensures measurement system integrity and allows for easy and broad application.

### ■ Wide Direct-Reading Range

Designed to minimize set up time and eliminate meter interpolation.

### ■ Automatic Cycling

Programmable measurement cycle permits user-defined constant throughput rate.

### ■ Statistical Measurement

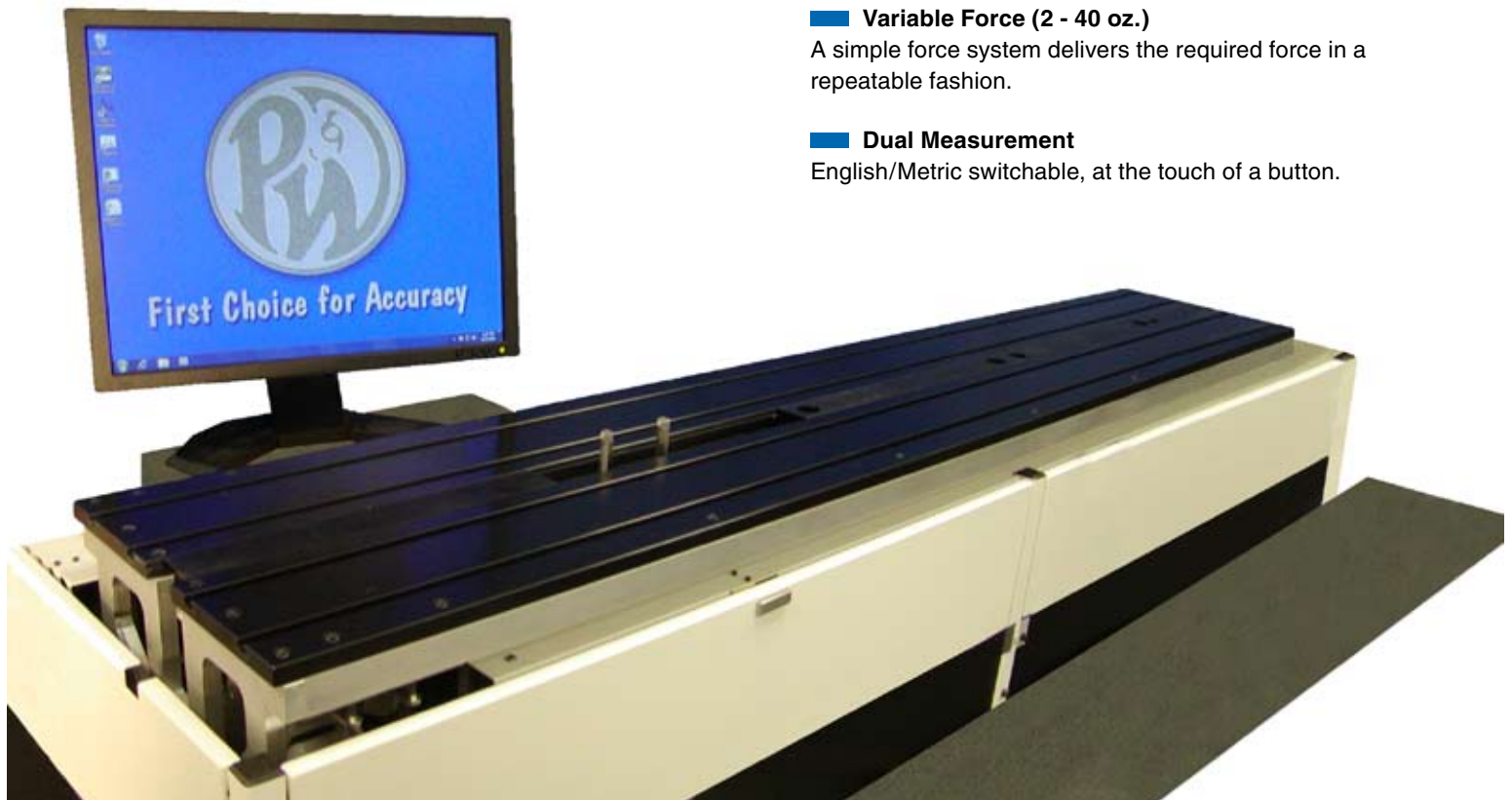
Summation of all measurements is stored on command. Stats display indicates computed mean value and one standard deviation.

### ■ Variable Force (2 - 40 oz.)

A simple force system delivers the required force in a repeatable fashion.

### ■ Dual Measurement

English/Metric switchable, at the touch of a button.



## Applications\*



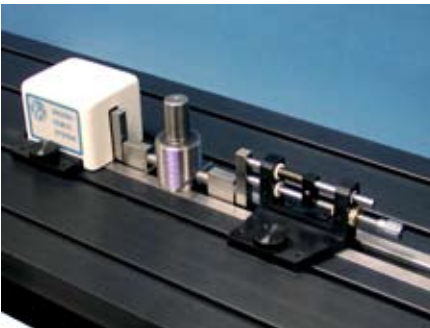
*Gage Blocks*



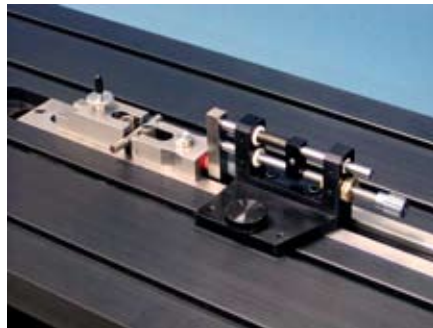
*End Standards*



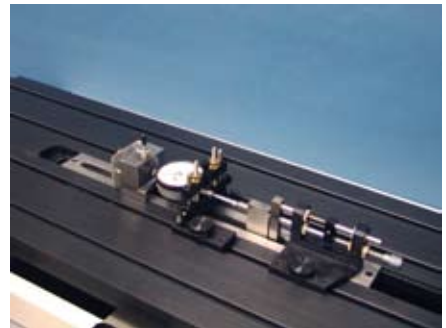
*Plain Plug Gages*



*Threaded Plug Gages*



*Pin Gages*



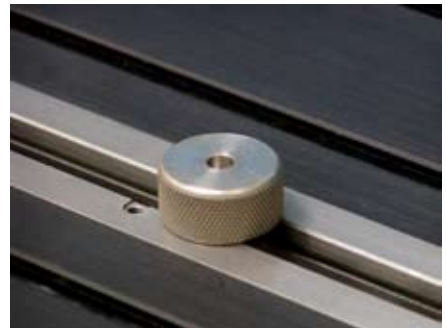
*Dial Indicators*



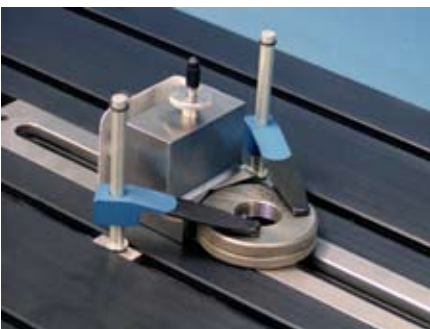
*Micrometers*



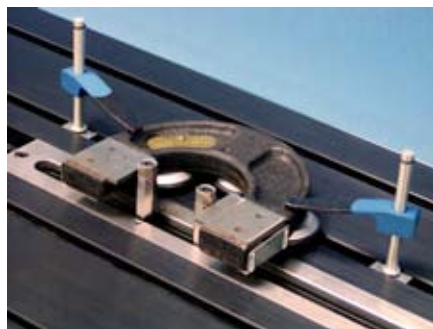
*Large Ring Gages*



*Small Ring Gages*



*Threaded Ring Gages*



*Snap Gages*



*Your Precision Component*

*\*The above represent the more popular applications. For additional applications, ask your local Pratt & Whitney Representative.*

## GageCal™

### PC Based Control

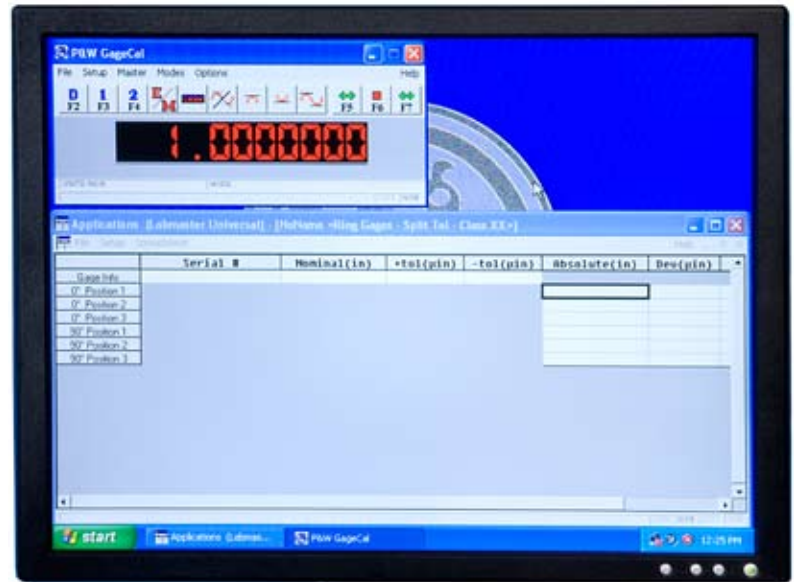
Powerful and resourceful, our GageCal™ control software sets a new standard for user-friendly calibration. By controlling the operation of the Labmaster and facilitating data collection, GageCal™ increases total measurement productivity. And with a graphics-rich user interface, you'll be amazed with how simple it is to use.

We designed GageCal™ to be intuitive and self-teaching. So much so, that the extensive context sensitive HELP screens are seldom called upon. Mouse or hot key driven, with pull down menus and icons that let you "click" your way through a calibration, GageCal™ helps put you at ease, so you can concentrate on the business of measuring. And the Microsoft® WINDOWS™ environment allows multitasking and data export to other programs such as gage management, EXCEL™, WORD™, or any other WINDOWS™ program.

### Smart Spreadsheets Speed Up Data Entry

Faster measurement begins with selecting an icon (or pressing the hot key) to first master the instrument, and then calibrate your particular gages. The user can choose between pre-defined applications (*Gage Blocks, Rings, Plugs, etc.*) and *Free Measure* (for custom applications). With an application selected, dialogue boxes will continuously prompt the user for information that will build and open a "smart" spreadsheet. This "smart" spreadsheet, in the case of pre-defined applications, will automatically enter nominal sizes, tolerance bands, define best wire size for thread measurements, calculate pitch diameters, and flag out of tolerance conditions as appropriate.

The operator simply chooses the class of gage (ie., XX or XXX), in the dialogue box, selects the appropriate cell in the "smart" spreadsheet, and clicks on the *close probe* icon (or presses the footswitch). GageCal™ displays the measurement in the "Current Reading" window and automatically updates the record. The data can be saved, printed in a customized report, or exported to many popular gage management software packages.



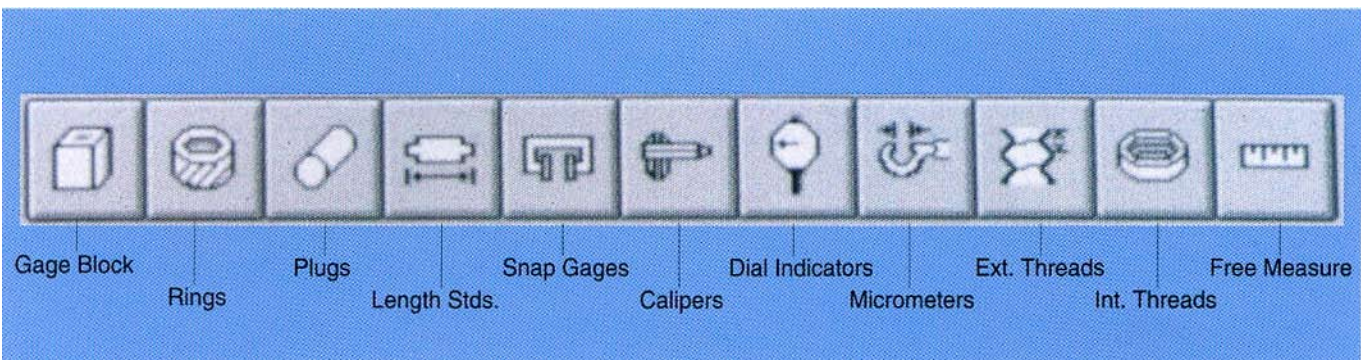
### Gage Management

Our optional gage management module, designed in accordance with ISO 17025 and ISO 9000, puts gage information at your finger tips. It represents a logical addition to the LABMASTER® because it makes storing, retrieving and reporting gage information quite simple. You will be able to track and display gage history, wear data, current users, the product evaluated with the gage, calibration dates, days since last calibration, and much more.

Additional subsystems of the gage management module include gage studies, gage crib, gage preventative maintenance, and gage archives. With them, you'll be able to control your gage data as well as your gages,

### Detailed Printouts to Your Specifications

The reporting system is extensive, offering both standard and custom reports. Common reports include standard calibration reports, gages due, recall letters, gage lists, supplier summaries, gage study listings, and many more.



## SPECIFICATIONS

Instrument Uncertainty: <sup>1,2</sup>	2 + 0.5L Microinches (±2 std. dev.)	0.05 + 0.5L/1000 Microns (±2 std. dev.)
Repeatability: <sup>1</sup>	1.6 Microinches (±2 std. dev.)	0.04 Microns (±2 std. dev.)
Resolution:	0.1 Microinch	0.0025 Microns
Measurement Range: Internal: External:	0.02" to 81" 0 to 80"	0.5 to 2056 mm 0 to 2032 mm
Direct Reading Range:	40"	1016 mm
Standard Contact Force:	0.5 ozf	0.14N
Variable Force:	2 to 40 ozf	0.56 N to 11.12 N
Measuring Probe Geometry:	0.0625" radius	1.6 mm radius
Table Lift Range:	1.5 inches	38 mm
Electrical Requirements:	110-240 V, 50-60 Hz, 2 A, 240 W	
Pneumatic Requirements:	1.5 SCFM at 50 psi	2.55m <sup>3</sup> /HR at 345 kPa
Dimensions: <sup>3</sup> (W x D x H)	70 x 20 x 16 inches	178 x 51 x 41 cm
Weight:	300 lbs.	137 kgs.
Transducer:	Helium-Neon 632.8nm (red)	

1. Environmental conditions should be within 0.5°F (0.25°C), 0.05 in Hg (1.5mm Hg), and 25% relative humidity between mastering and measuring. Simply re-master if variation exceeds these conditions. Re-mastering takes less than 1-minute.
2. Total measurement uncertainty will vary with grade of master and application.
3. Instrument width is 81" (2058 mm) when 80" (2032 mm) probes are attached.

### NIST TRACEABLE

Labmaster's exclusive Digital Interferometer-based sensor, accurately measures length by comparing the measurement probe position to the absolute wavelength of a laser light source.

## WARRANTY POLICY

Any part which, under normal operating conditions in the plant of the original purchaser, proves defective in material or workmanship within one (1) year from the date of shipment as determined by **Pratt & Whitney's** inspection, will be repaired free of charge, f.o.b. factory Bloomfield, Connecticut, provided that the product has been properly installed, maintained and operated within the limits of rated and normal usage.

For further information call or write:

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