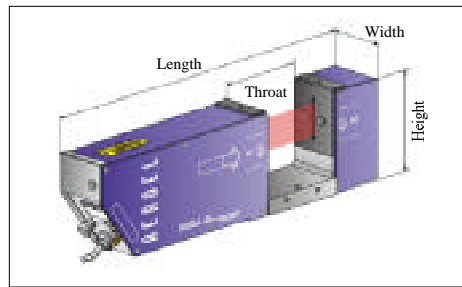


Specifications	Meclab 40	Meclab 80
Measurement field	40mm (1.57")	80mm (3.15")
Measurement range	0.05 - 38mm (0.002 - 1.50")	0.08 - 78mm (0.03 - 3.07")
Programmable resolution	0.01/0.001/0.0001mm (0.0004/0.00004/0.000004")	0.01/0.001mm (0.0004/0.00004")
Repeatability	± 0.5µm (0.00002") @ 3 Sigma	± 1µm (0.00004") @ 3 Sigma
Scan frequency	200Hz	200Hz
Laser spot size	0.06mm (0.0024")	0.2mm (0.008")
Laser source	visible diode, class 2	visible diode, class 2
Dimensions (L x W x H)	445 x 68.5 x 134mm (17.5x 2.69 x 5.27")	736 x 60 x 163mm (28.97 x 2.36 x 6.42")
Throat distance (T)	101.9mm (4")	200/300mm (7.87/11.81")
Operating temperature	0 to 45° C	0 to 45° C
Weight	5.5Kg (12.12lbs.)	6.2Kg (13.66lbs.)



Meclab laser gauge head dim. in L x W x H

### IBU - 10 Control Unit

LCD Display	backlit, 2 lines, 40 char. each line numerical, includes 8 additional function keys
Keyboard	
Alarm outputs	4 programmable (30 or 24 VDC)
Communications	RS 232 serial port
Inputs	2 optocoupled (10-30VDC, 10ma)
Protection class	IP54
Power input	24VDC or 20 VAC, 15W
Operating temperature	0 - 50° C
Dimensions (LxWxH)	282 x 210 x 60mm (11.1 x 8.27 x 2.36")



IBU - 10 dimensions in mm.

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### Definitions

**Measurement Field** - the area within which the object must be placed to obtain the specified accuracy.

**Measurement Range** - the range of diameters that are measurable by the laser micrometer to the stated specifications.

**Repeatability** - the maximum variation of the measured diameter. The value specified is at an ambient temperature of 20° C, ± 1° C. The confidence level is ± 3 sigma (99.7%) with a one second measurement.

**Throat distance** - the distance between the transmitter and receiver on the laser gauge head. With the Meclab 40 it is fixed at 105mm (4.13"). The Meclab 80 allows adjustment between 200 or 300mm (7.87/11.81").

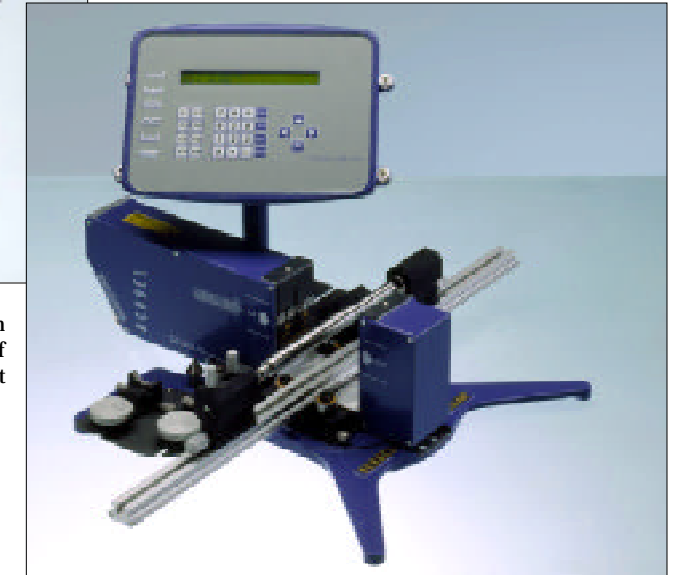
The closer you look, the better we measure!

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Pictured above is the Meclab 80 and to the right is the Meclab 40 bench top laser optical micrometer. Both units are pictured with a variety of standard part holding fixtures including the optional baseplate support assembly for the precision linear slide and IBU control unit.



### General Description

The Meclab family of laser micrometers are specially designed to be used in bench-top applications. They enable the measurement of a wide range of components of different shape and size. For example, gauge pins, motor shafts, rubber rollers, ground or turned parts, etc.. Meclab is ideally suited for incoming inspection, final test, production monitoring and quality control.

The bench top series is packaged for ease of use. All the operational controls are located on an operator's console which can be located for the user's convenience near or removed from the laser micrometer. The two components which make up the Meclab are the ALS 40 or ALS 80 scanning laser gauge and the IBU-10 control unit.

The optional baseplate support assembly facilitates the mounting of the precision linear slides. When heavy or long parts are placed in the gauge tilting of the gauge is prevented. In addition, the upright column allows rotation of the IBU control unit to the desired user viewing angle of the display. By facing the gauge front to back to the operator, the operator can easily see the display and part insertion is greatly simplified.

Meclab enables fast and repeatable measurements for diameter, ovality, run out, edge position, gaps between parts, taper, throats and peaks. These tasks are easily performed and can be compared to programmed tolerance limits.

### Features

- 0.0001mm (0.000004") measurement resolution
- ± 0.5µm (0.00002") repeatability @ ± 3 sigma
- Measures parts from 0.05mm to 78mm dia. (0.002 to 3.07")
- Front panel backlit LCD display (2 line x 40 char.)
- 100Hz and 200Hz scan rates
- 9 pre-programmed different measurement types
- 3 pre-programmed measurement modes for QA
- Programmable out-of-tolerance indicators
- Keypad functions for statistical analyses
- RS 232 serial port for PC and printer use
- Class 2 visible laser diode for safety and long life

### Benefits

- Fast non contact measurements
- Remastering is not required for different size parts
- Patented self calibration guarantees accuracy
- Objective measurements regardless of operator experience
- Fast throughput with high accuracy results

**Operation**

The Meclab series is very easy to use. By pressing the appropriate key(s) on the large keypad, the user can easily set the nominal and tolerance values, specify the measurement type, measurement mode, the units of measure (mm or inches), and display the update rate.

Once the initial values are set, the measurement can be repeated for each part which is measured. A statistical analysis can be requested at any time by the operator. Like wise the operator can automatically print out the results after each part is measured (or send the data to a PC).



IBU-10 Control Unit

The keypad is uncluttered and very simple to use. It can easily be mounted to a wall or placed on the table top. It is angled for ease of keystroke entry and viewing of data.

**Laser Micrometer Functions**

**Dimensional Measurements**

The user has a choice of nine different measurements including, diameters, gaps, apertures, run-out and multiple dimensions on the same part. All operations are available from the keypad.

For each measurement type, three measurement modes are also available. They include, single measurement, repeated single measurement, and continuous measurement.

**Tolerance Alarms**

A visual indicator identifies an "out-of-tolerance condition after an operator enters the tolerance limits. The user can program nominal values with upper and lower warning conditions and upper and lower out of tolerance conditions. Output signals are available to drive external audio and visual devices.

**Statistical Analysis**

The measured values can be stored and processed to get statistical values on each measured parameter: average, max, min, standard deviation, cp and cpk values (\*\*). A serial printer can be connected to list the result of each measurement and to print, on command, the statistical report.

**Programming Complex Parts**

When multiple sizing is required, a "gauging program" can be defined and stored in a "library". Up to 10 different measurements can be made on each part. The program includes nominal values and tolerance limits for every result; up to 15 programs for complex parts can be stored in the library.

**Memory**

The measured data are saved in memory along with typical data logging information such as; sample identification, date, time, operator code, product reference and other 2 user defined codes.

This feature allows different operators to use the gauge without any danger of data scrambling. Many records (100 to 700 - depending upon complexity) can be stored in a FIFO memory ( First In First Out ). A warning message alerts the operator that the memory is going in overflow. In every case the new data will be saved, erasing the oldest one via FIFO.

**Communications Interface**

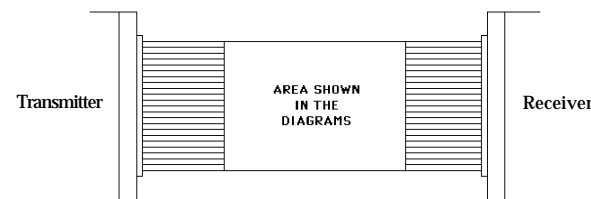
A standard serial RS 232 interface is included to interface to any plant computer, PLC, printer or PC which uses serial communication. A PC can be setup to perform data acquisition for analyses and high level statistics.

**Typical Applications**

There are numerous applications for which the Meclab series can be used. To understand how the micrometer can be used, an explanation of how the gauge sees parts needs to be discussed.

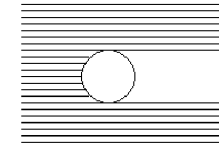
The left side of the laser micrometer transmits a laser beam of light. The beam is in the form of a ribbon of light. On the right side of the micrometer is a receiver. The receiver recognizes a "light" or "no light" condition. When a part is placed in the beam the receiver measures the transitions of "light" to "no light". We call these transitions "edges". When you measure a complex part, you simply tell the gauge which "edges" you want to measure.

Illustrated below is a sketch of the laser micrometer and the measurement field. The box defined by the measurement field (area) is where the part to be measured is placed. Following are some typical examples.



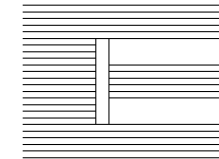
**Simple Diameter**

The outside diameter of metallic or non metallic parts is easily measured. Just place the part in the V block and read the display on the IBU 10 controller.



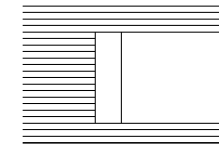
**Inside Diameter**

A washer is a good example of making an inside diameter measurement. Other components could include O rings, CDs, etc. Simply select edges 2 and 3 to be measured. If there are other holes in the part(s), you just select the appropriate edges you want to measure.



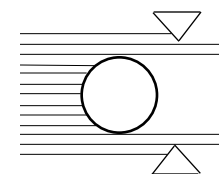
**Piece Part Length**

The length of discrete parts can also be measured. Sorting can be based on size, etc. As long as the part length is smaller than the height of the beam, the part can be measured.



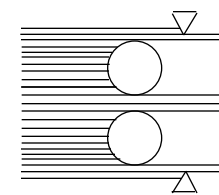
**TIR**

Total Indicated Runout is a common measurement made with a laser micrometer. By using reference edges the laser micrometer measures the gap between the part and the lower reference edge as the part is rotated through 360°. By using the linear slide with centers or cones, TIR is easily measured.



**Gap Between Rollers**

The gap between round parts is measured by using reference edges. The laser light which passes between the two parts is measured. In this manner the gap can be set precisely.



There are many more measurements which can be made by the bench top micrometer. It is just a matter of selecting the appropriate edges. It is quick and easy to set up the required edges for measurement. The bench top micrometer is a very versatile tool for any metrology laboratory. The fixtures depicted in the next column demonstrate the part holding

capability and flexibility. **Fixtures**

The Meclab series is designed to accommodate a variety of part holding fixtures for easily making measurements. Some of the fixtures are shown below.

**Fixed V Block**

The fixed V block is mounted directly to the Meclab bench micrometer's base. It has an end rest on one end which can be adjusted in height to accommodate a stepped part. In this manner the part will always be measured in a horizontal position. The base adjustment enables "in/out" positioning for perfect part placement.



**Linear Slide/Modular Fixtures**

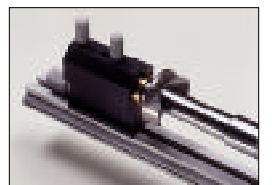
The linear slide which has a 500mm (19.68") range can accommodate a variety of part holding fixtures. Pictured to the right is a section of the linear slide with the fixed V block attached.



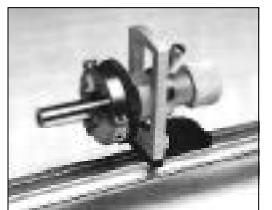
A pair of adjustable V blocks are designed to accept long and stepped shafts which are not on a center. Since each V is independent it can be adjusted in height to accommodate the end of the shaft. Each V can be placed anywhere along the slide.



Adjustable centers and cones are mounted in a similar fashion along the slide. The adjustment on the end holds and secures the part while the adjustment on top straightens the part so that it is horizontal in the measurement field. The cone fixture is illustrated.



A rotating chuck is available for mounting on the linear slide. It can also be ordered for use without the linear slide, whereby it mounts directly to the meclab base.



In summary, depending on the type of part which is to be measured, we can offer an appropriate holding fixture to make the measurement in a simple and cost effective manner.