

Digital Lever Probe

For high accuracy dimensional measurements
in restricted access applications

Datasheet
502583
Issue 2.2



Features

- ▶ Measuring Range 0.5 mm
- ▶ Resolution Programmable to $< 0.01 \mu\text{m}$
- ▶ Tip Forces down to 5 g
- ▶ Excellent Repeatability
- ▶ Up to 3906 Readings/Second
- ▶ Industry Standard Styli
- ▶ Compact Size
- ▶ Direct Reading in mm/inch

Description

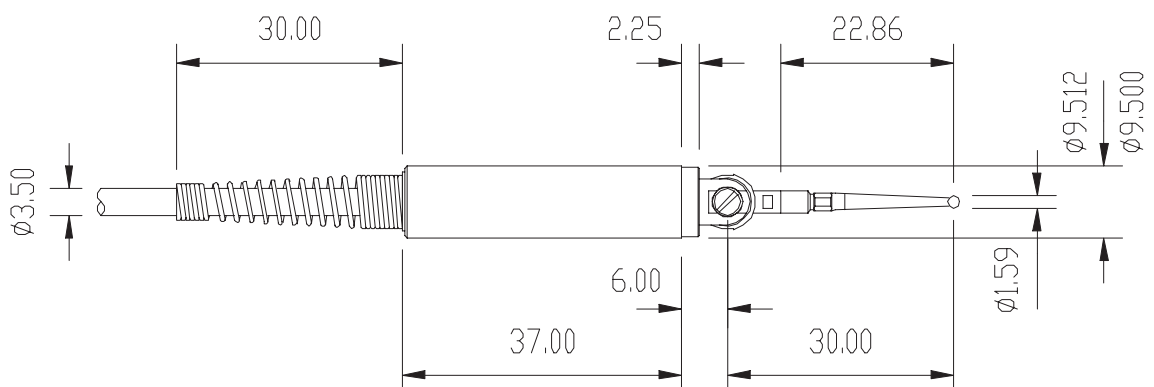
Solartron's new Digital Lever Probe has been conceived for the precision measurement market. This probe is ideally suited to applications where the use of axial measuring probes is not possible, and where a low tip force and a high number of probing points are required. Its simple design and exceptional reliability result in a reduced cost of ownership without any reduction in performance.

Due to its cylindrical housing geometry, the Lever Probe can be mounted in any attitude relative to the intended target. It can be mounted via the use of 8 mm peg or industry standard dovetail mounting blocks, or clamped directly into a 9.52 mm mounting hole.

With a measurement range of 500 microns and repeatability below 0.15 micron, the Digital Lever Probe can be easily integrated into measurement systems using Solartron's Orbit® Network.

Given its digital output, the digital lever probe easily lends itself to connection to a PC, PLC or to Solartron's digital readout, and can coexist with a multiplicity of other Solartron or non-Solartron sensors on a single network.

Mechanical Drawing



CAD drawings are available to download from www.solartronmetrology.com

Applications

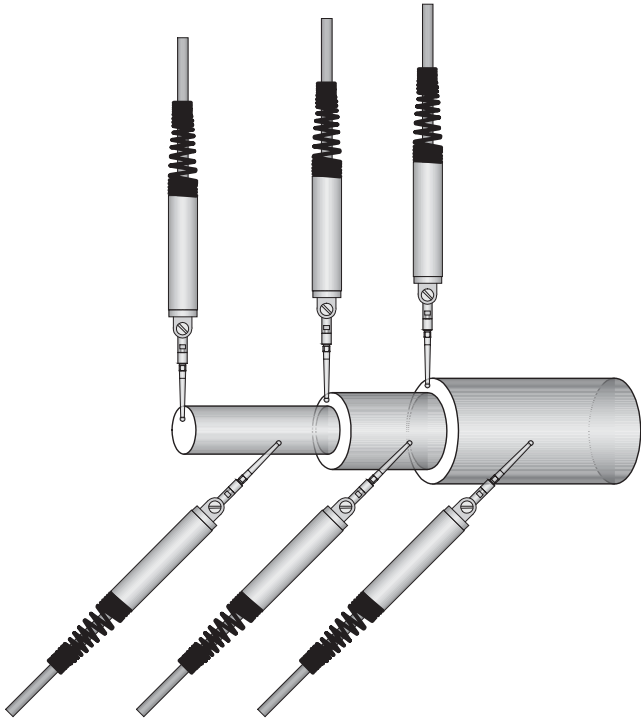
Measurement of Delicate Components

The combination of the Digital Lever Probe's reduced size and low tip force allows accurate and reliable measurements to be performed on delicate components.



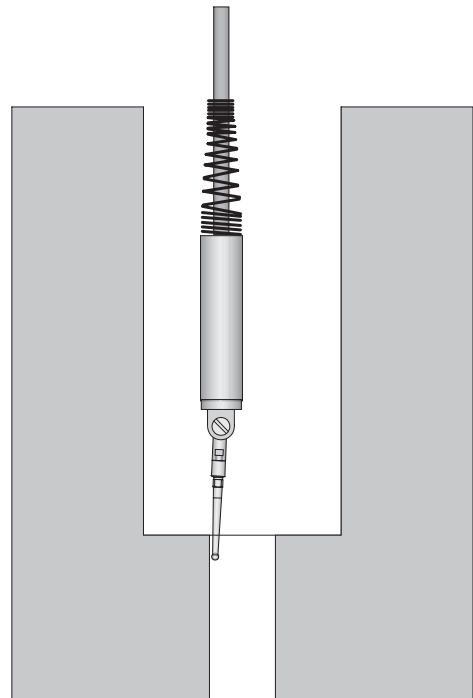
Simultaneous Gauging of Several Closely Located Surfaces

The very high resolution and fast reading rates make the Digital Lever Probe an ideal sensor for dynamic applications such as profiling a rotation shaft.



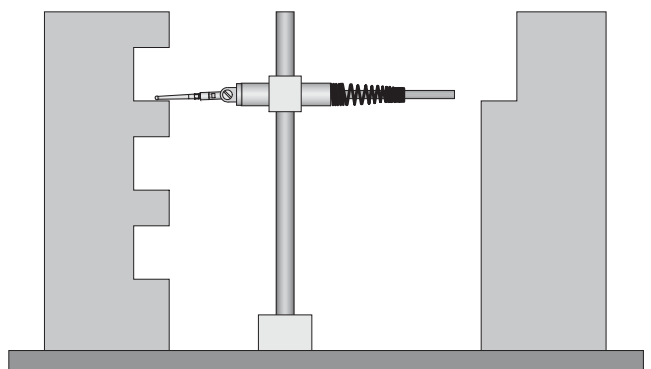
Exploring the Geometry of Deep Lying Surfaces

The Digital Lever Probe's small body makes it easier than conventional lever type probes to access confined spaces to perform accurate measurements.



High Accuracy Measurement of Height Dimensions

The Digital Lever Probe is also suitable for high accuracy transfer of height dimensions from a reference piece to the object surface.



Technical Specification

Measurement

| | |
|---|--|
| Mechanical Travel | 0.6 mm |
| Measurement Range | 0.5 mm |
| Start of Measuring Range | 20 μm to 30 μm from limit stop |
| Stylus Adjustment | 180° |
| Accuracy (with measurement contact normal to the axis of the stylus) | $\pm 0.1 \mu\text{m} \pm D \times 0.08\%$ (where D is the distance from setting master) |
| Repeatability | < 0.15 μm on axis < 0.3 μm cross axis |
| Hysteresis | < 0.25 μm |
| Resolution | User selectable to < 0.01 μm |
| Measurement Bandwidth | Programmable from 6 Hz to 460 Hz |
| Reading Speed | Up to 3906 readings/second (Dynamic Measurement Mode) |
| Tip Force | Options for 5 g to 30 g in 5 g increments |
| Temperature Coefficient | 0.1 $\mu\text{m}/^\circ\text{C}$ |
| Life | Better than 5 million measuring cycles (dependant on application) |

Mechanical

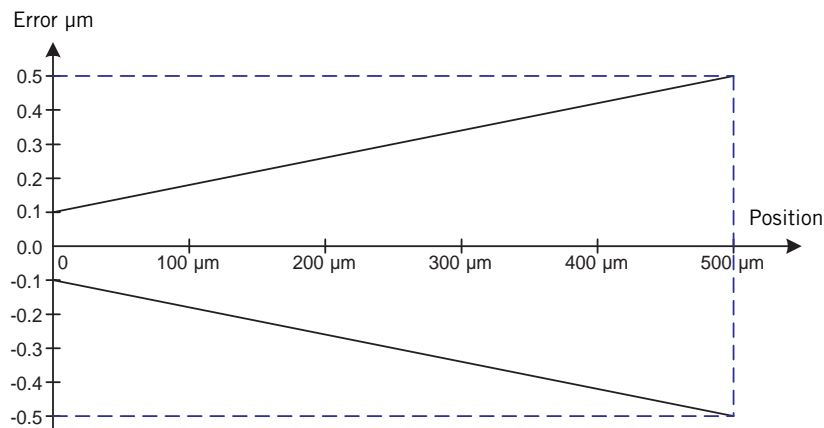
| | |
|-------------------|---|
| Mass | < 15 g (< 0.033 lbs) |
| Material of Frame | Stainless Steel |
| Mounting | Direct clamping into 9.52 mm hole Mounting blocks for 8 mm peg mount and industry standard dovetail available as accessories |
| Stylus | Available in diameters of 2.54 mm, 1.59 mm, 0.79 mm & 0.39 mm Mounting thread 1-72 UNF |

Environmental

| | |
|-----------------------|--|
| Storage Temperature | -20°C to +85°C |
| Operating Temperature | 0°C to +60°C |
| Shock | To maintain best performance the Lever Probe should be protected from shock |

Electrical Interface

| | |
|--------------------|---|
| Energising Voltage | 5 V ± 0.25 VDC (powered from Orbit Network) |
| Energising Current | 55 mA (at 5 VDC) (powered by the Orbit Network) |
| Interface | Orbit Network |



Plot showing typical Lever Probe performance

Ordering Guide for the Digital Lever Probe

D L 0 5

Cable Length

x = meters required

Tip Force

| | |
|---|---|
| 0 | 5 |
| 1 | 0 |
| 1 | 5 |
| 2 | 0 |
| 2 | 5 |
| 3 | 0 |

5 g

10 g

15 g

20 g

25 g

30 g

Stylus Ball Tip Diameter

| | | |
|---|---|---|
| 0 | 3 | 9 |
| 0 | 7 | 9 |
| 1 | 5 | 9 |
| 2 | 5 | 4 |

0.39 mm (0.015")

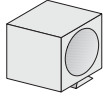
0.79 mm (0.031")

1.59 mm (0.062")

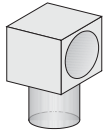
2.54 mm (0.100")

Accessories

The Digital Lever Probe can be clamped directly into a 9.52 mm mounting hole. Alternatively the following mounting blocks are available:



Industry standard dovetail mounting block
Part Number 804920



8 mm peg mounting block
Part Number 804919

A range of spare ball tipped styli is available with different ball diameters.



| Ball Ø | Part Number |
|------------------|-------------|
| 0.39 mm (0.015") | 008307-015 |
| 0.79 mm (0.031") | 008307-031 |
| 1.59 mm (0.062") | 008307-062 |
| 2.54 mm (0.100") | 008307-100 |

The mounting threads are all 1-72 UNF.



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