

Z5+

Multiple Spot Distance Measurement Probe

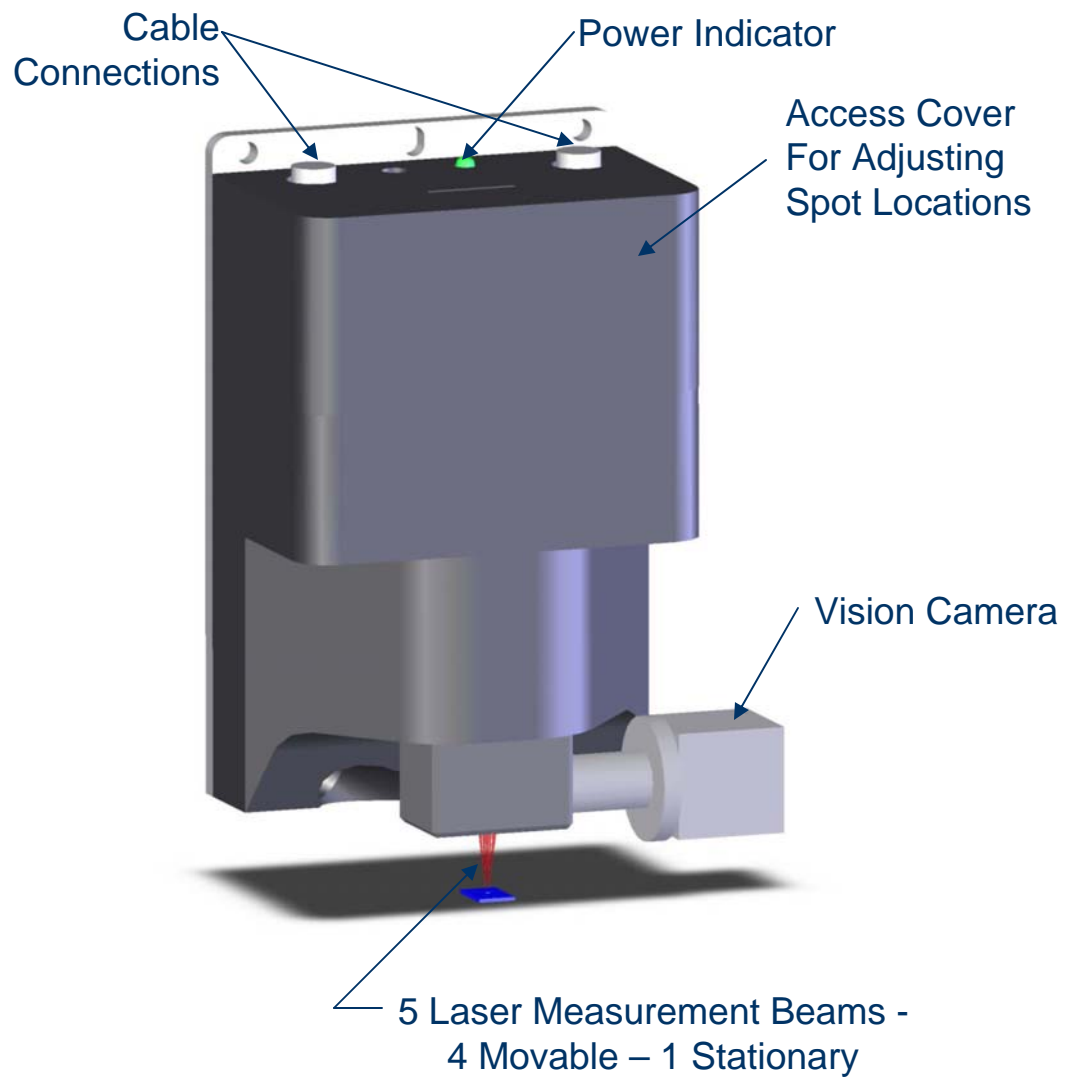
May 2006



Z5+ Description

- The Z5+ is a fast, versatile, distance measurement device.
- The non-contact, laser based technology allows up to 5 user selectable locations to be measured simultaneously.
- X, Y and Z information is gathered for each measurement location.
- This information may be used to determine:
 - relative heights
 - simple shape
 - surface angles
- A process vision camera provides feedback to the user for easy positioning of the measurement locations and verifying them on the measured product.

Z5+ Features





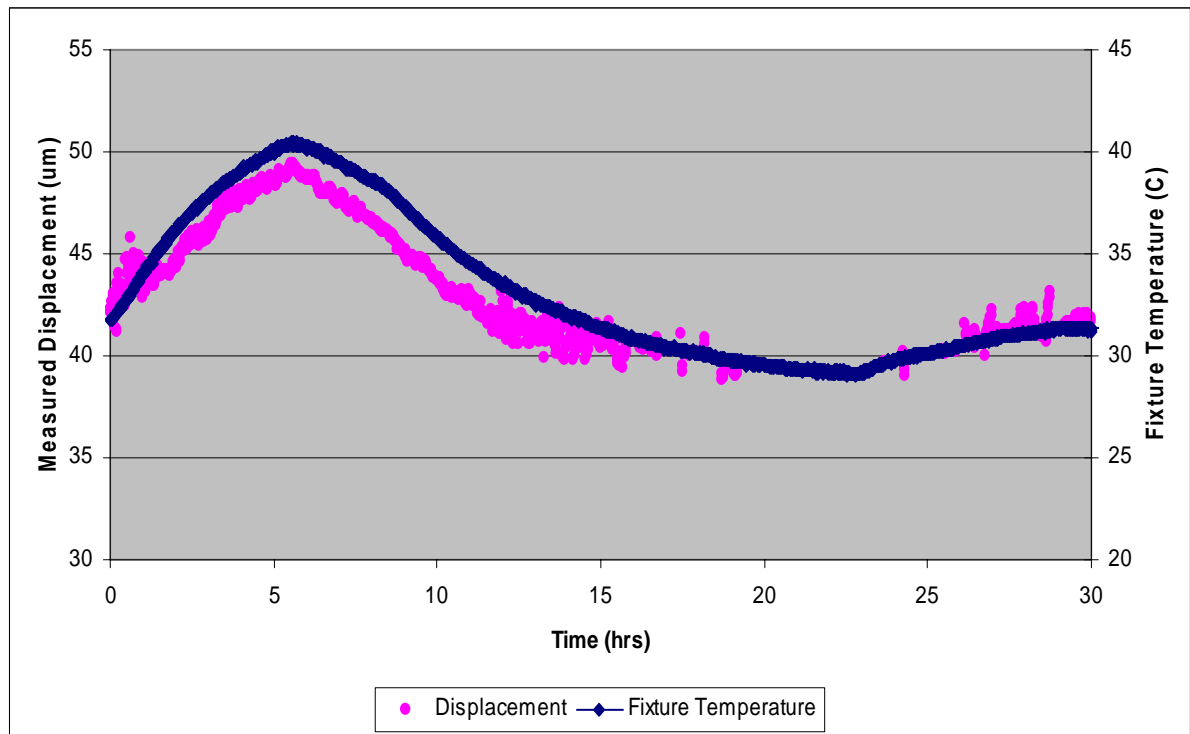
Preliminary Specifications

	X	Y	Z
Measurement Range	$\pm 0.75\text{mm}$	$\pm 0.75\text{mm}$	$\pm 1.25\text{mm}^1$
Resolution (N=1)	$0.11\mu\text{m}$	$0.11\mu\text{m}$	$0.11\mu\text{m}$
Resolution (N=5)	$0.08\mu\text{m}$	$0.08\mu\text{m}$	$0.08\mu\text{m}$
RMS Repeatability	$0.11\mu\text{m}$	$0.11\mu\text{m}$	$0.11\mu\text{m}$

Angular Resolution ² (N=1):	1 arc-min
Thermal Stability:	<0.002%F.S./°C
Laser Wavelength / Power:	660 nm / < 12mW
Sensor Technology:	1/3" CCD (x3)
Standoff:	17mm
Spot Size:	~50 μm
Measurement Speed:	~150 msec
Physical Dimensions (mm):	180 (H) x 160 (W) x 80 (D)
Power Requirements:	None (supplied via cameras)

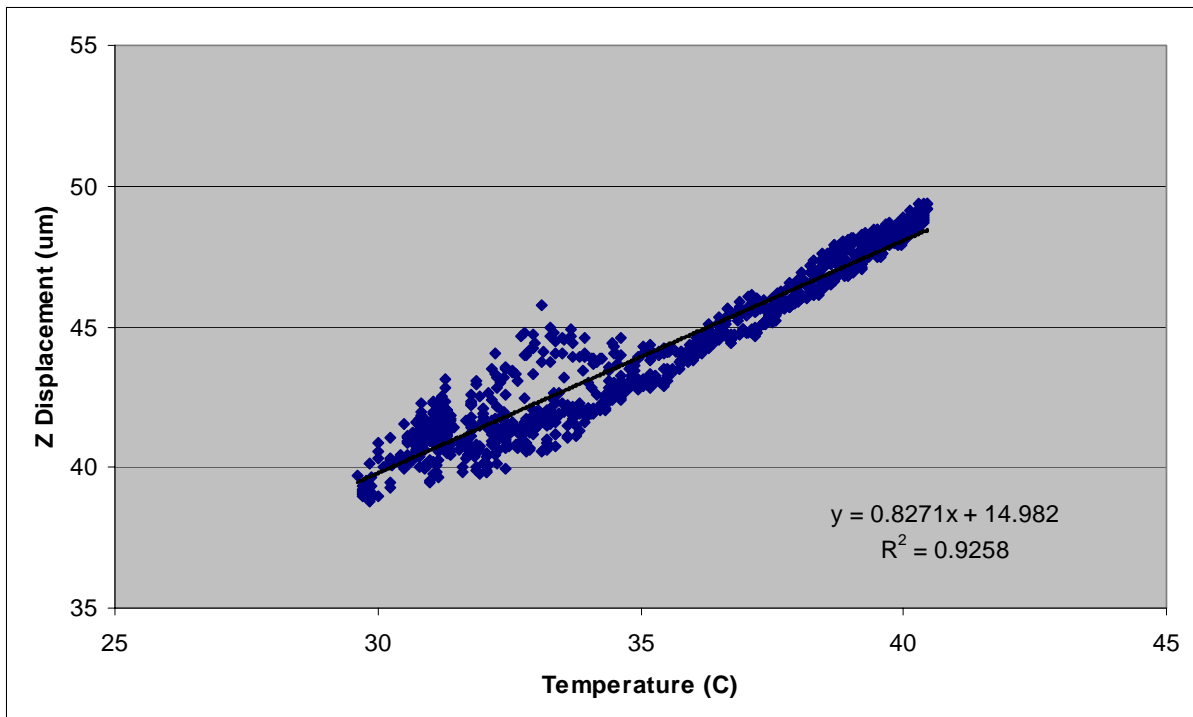
1. Effective range for all spots when in a 1mm square pattern. Range of $\geq\pm 1.5\text{mm}$ can be achieved on smaller patterns.
2. Numerically deduced value based on geometries for 0.5mm square spot pattern.

Thermal Stability Study



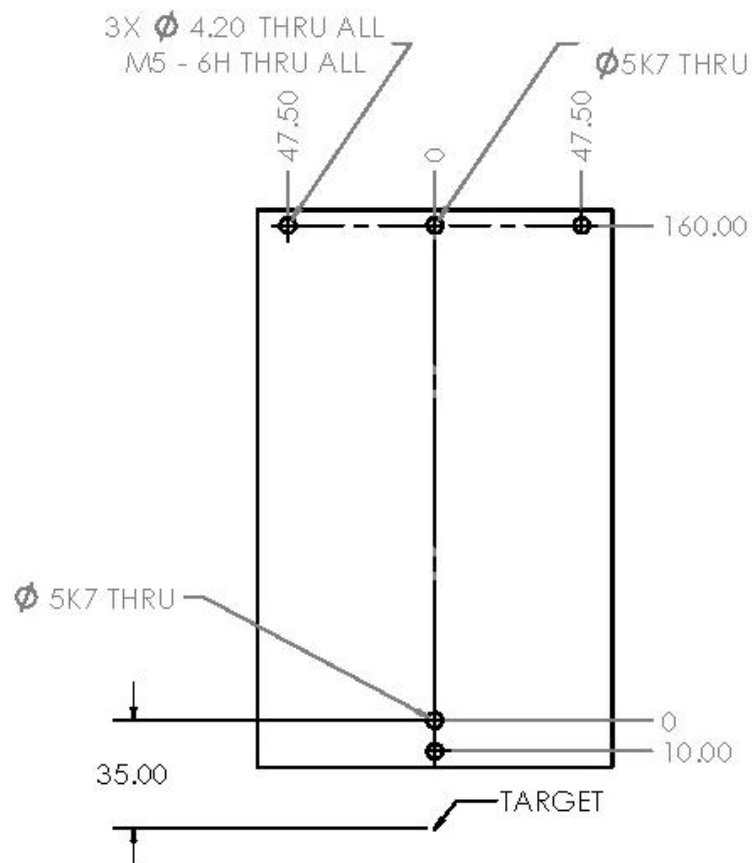
Note: Test shows total displacement sensitivity (probe + fixture) over a range of temperatures during a 30 hour period.

Thermal Sensitivity Relationship



Initial study produced a total thermal sensitivity of 0.83 $\mu\text{m}/\text{C}$, while the known fixture contribution is 0.35 $\mu\text{m}/\text{C}$. Thus, the net contribution from probe is $\sim 0.5 \mu\text{m}/\text{C}$.

Z5+ Mounting Details



NOTES:

- 1) 5K7 HOLES ARE PRESS FIT FOR M5 DOWEL PINS
- 2) DOWELS TO PROTRUDE 5MM MAX.
- 3) OPTIONALLY, THE M5 TAPPED HOLES MAY BE MADE AS CLEARANCE HOLES FOR M6 SCREWS FOR SCREW MOUNTING FROM THE REAR OF THE MOUNT PLATE.