# MICROTRAK™ 4

## HIGH SPEED DIGITAL
## LASER DISPLACEMENT SENSOR
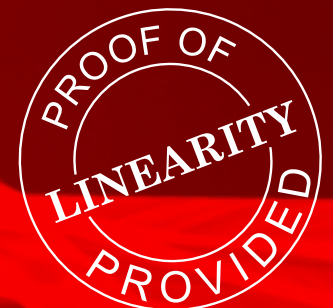
RANGES
FROM 2mm
TO
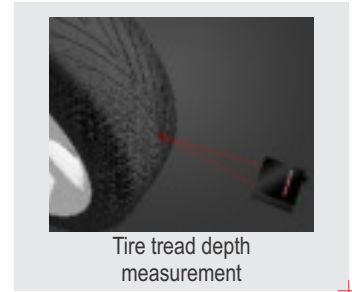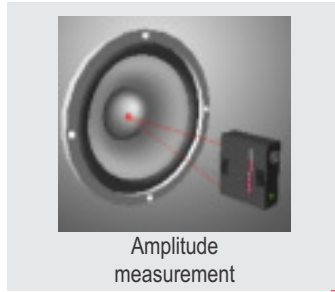200mm
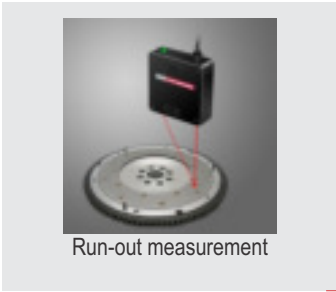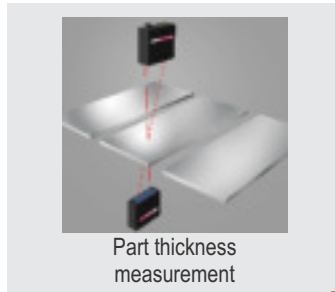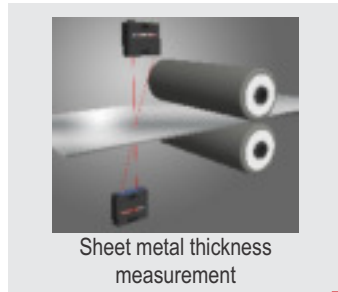
**mti instruments**
MICROTRAK™ 4

- Direct power from USB port
- ~40kS/sec. CMOS sensor full frame rate
- Included Software Development Kit (NI LabVIEW, DLL and .NET)

Accurate and repeatable measurements from highly reflective to dull surfaces

PROOF OF LINEARITY PROVIDED

with every system shipped!

Build-up measurement in a roll


Sheet metal thickness measurement


Part thickness measurement


Vibration measurement of motor shaft


Run-out measurement


Distance to pavement measurement


Amplitude measurement


Tire tread depth measurement

**No External Controller Needed** - Out of the box, the MTI basic program runs on your PC to make measurements. Intuitive and straight forward buttons makes configuring and acquiring data simple.

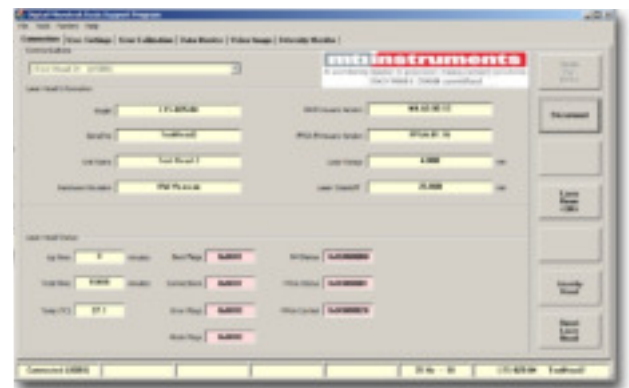**Software Development Kit Included** - for custom programs used by system integrators.

**Visible Laser Spot** - Allows for easy positioning and alignment of the laser head.

**Easy Setup** - With the built-in 5-color position indicator, there is no need for an external controller to determine the laser mounting location and attain the precise distance placement.

**Built-in Low Pass Filters**

**Auto Gain Circuitry** - Automatically determines and adjusts the ideal laser power needed for accurate and repeatable measurements on different surface types.

**Cut-Time Feature** - Ignore holes and cutouts with its bridging function.



**Reliable measurements for very dark or very shiny (mirror-like) targets** - using available 2X exposure function
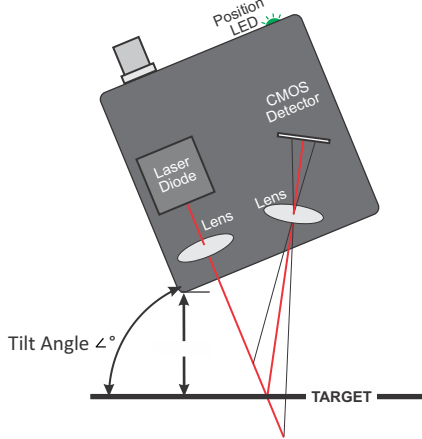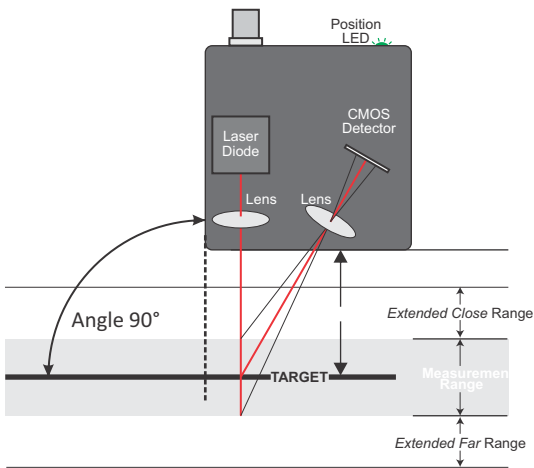
**Plug and Play USB**
No separate power supply needed
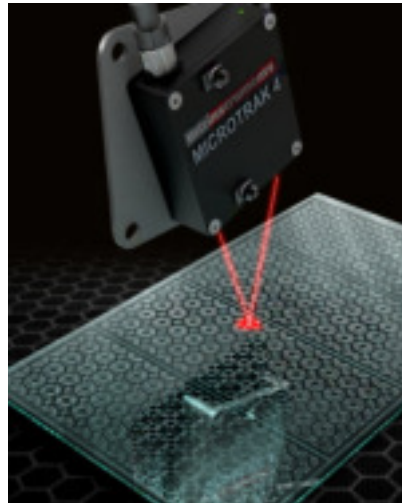All digital output

## Applications

- Thickness
- Warpage
- Alignment
- Displacement
- Vibration
- Step Height
- Shaft Run-out
- Road Profile
- Presence
- Fill Height
- Flatness
- Profiling
- Thermal Expansion/ Contraction
- Structural Dynamics
- Dimensional Gauging

| Standard Range | mm | 2 | 4 | 10 | 20 | 20 | 40 | 100 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| **Standoff** | mm | 25 | 25 | 50 | 50 | 120 | | 200 | 300 |
| **Displacement** | | | | | | | | | |
| Close Extended Mode | mm | 23.75 | 22.5 | 43.75 | 37.5 | 107.5 | 95 | 137.5 | 175 |
| Close Standard Mode | mm | 24 | 23 | 45 | 40 | 110 | 100 | 150 | 200 |
| Far Standard Mode | mm | 26 | 27 | 55 | 60 | 130 | 140 | 250 | 400 |
| Far Extended Mode | mm | 26.25 | 27.5 | 56.25 | 62.5 | 132.5 | 145 | 262.5 | 425 |
| **Linearity (standard range)** | | | | | | | | | |
| 1X exposure, 20kHz | % FSO | 0.0375% | | | | | | | |
| 2X exposure, 5kHz | % FSO | 0.0300% | | | | | | | |
| 1X exposure, 20kHz | μm | 0.75 | 1.50 | 3.75 | 7.50 | 7.50 | 15.00 | 37.50 | 75.00 |
| 2X exposure, 5kHz | μm | 0.6 | 1.2 | 3 | 6 | 6 | 12 | 30 | 60 |
| **Noise (2X, 500Hz)** | | | | | | | | | |
| At standoff to white | μm RMS | 0.125 | 0.25 | 0.625 | 1.25 | 1.25 | 2.5 | 6.25 | 12.5 |
| **Spot Size** | | | | | | | | | |
| Major at standoff | μm | 30 | 30 | 25 | 25 | | 100 | | 130 |
| **Maximum Resolution** | nm | 38 | 76 | 191 | 381 | 381 | 763 | 1,907 | 3,815 |



Position LED

CMOS Detector

Laser Diode

Lens   Lens

Angle 90°

*Extended Close* Range

TARGET

Measurement Range

*Extended Far* Range



Position LED

CMOS Detector

Laser Diode

Lens   Lens

Tilt Angle ∠°

TARGET

| Model | | DTS-025-02/S | DTS-025-04/S | DTS-050-10/S | DTS-050-20/S |
|---|---|---|---|---|---|
| Product # | | 8000-7040-001 | 8000-7032-001 | 8000-7033-001 | 8000-7034-001 |
| **Standard Range** | mm | 1.8 | 3.7 | 9.7 | 19.3 |
| **Stand-off** | mm | 16.7 | | 44.0 | |
| **Tilt Angle** | ∠ | 67.5° | | 75° | |



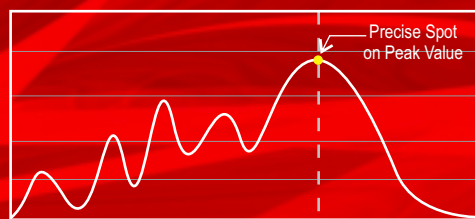| Model | | DTS-025-04/G |
|---|---|---|
| Product # | | 8000-7032-002 |
| **Standard Range** | mm | 3.7 |
| **Stand-off** | mm | 16.7 |
| **Tilt Angle** | ∠ | 67.5° |

*Linearity is defined as the peak measured variation, using bandwidth limited data, from the best fit linear line constructed from all the points taken over the full scale range.

++ Please refer to the Users Manual for complete instructions for mounting specular heads.
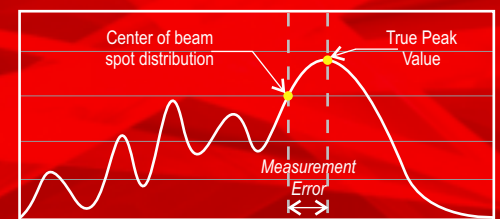
# MICROTRAK™ 4 uses Highly Precise CMOS Technology

The Microtrak™ 4 laser displacement sensor head is the ideal solution for quality and process control applications. Using the latest CMOS sensor technology, the Microtrak™ 4 precisely monitors the intensity of light received on a pixel array and optimizes itself to the sensed conditions.

Accurate advanced CMOS sensor



Precise Spot on Peak Value

Spot on CMOS

Errors occur using competitive PSD sensors



Center of beam spot distribution

True Peak Value

*Measurement Error*

Spot on PSD

**(1) MICROTRAK™ 4 Laser Sensor Head**

**(1) USB drive Software, Manual & Drivers**

USB/Power cable is available as a separate item. Please check optional accesories for length selections.

### USB/Power Cable

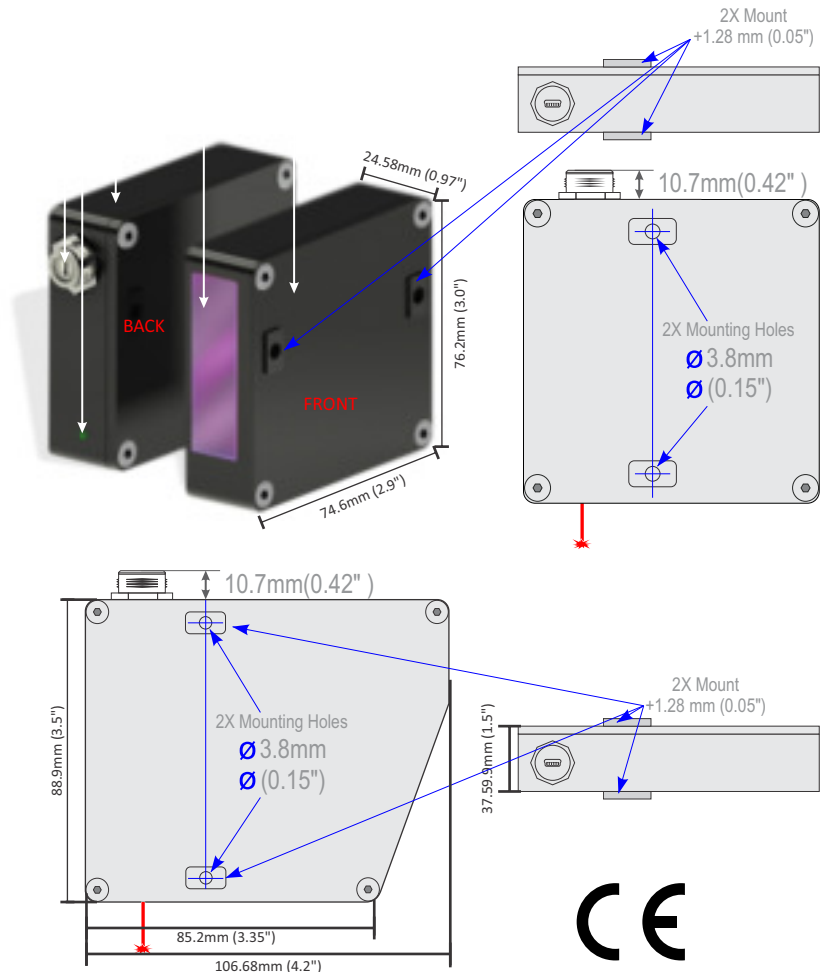| 2 meters | 8000-7020-002 |
|----------|---------------|
| 4 meters | 8000-7020-004 |

**FS-5 Laser Head Mount and Positioner P/N: 8000-6725**

**FS6-1 Right Angle Bracket (25/50) P/N: 8000-6431**

**FS6-2 Right Angle Bracket (120/200/300) P/N: 8000-6432**

| Maximum Sampling Rate | 40k (38277.5) Frames/s |
|---|---|
| **Exposure Time** | |
| 1x | 25 µs |
| 2x | 50 µs |
| **Filter** | 0.1Hz to 20kHz (1st order, exponential) |
| **Practical Maximum Bandwidth** | 15kHz |
| **Interfaces Supported** | |
| Digital | USB2.0 |
| Analog | None |
| **Supported Datarates** | 100, 200, 500, 1k, 5k, 10k, 20k, 40k Samples/s |

| Software | |
|---|---|
| MicroTrak™ 4 Basic | Windows® 7, 8, 10 |
| **Supported Interface Software** | |
| DLL | Windows® 7, 8, 10 |
| .NET | Windows® 7, 8, 10 |
| LabVIEW™ | Windows® 7, 8, 10 |

| Laser Wavelength | 630nm to 670nm |
|---|---|
| **Maximum Power Level (factory set)** | |
| Maximum | 4.9mW |
| Typical | 2mW |
| **Laser Power Class** | 3R IEC60825 |

| Nominal Supply Voltage | |
|---|---|
| **SELV from USB2.0** | 5 V |
| **Maximum Supply Ripple** | 100 mVpp |
| **Nominal Supply Current** | 100 mA During Enumeration |
| **Nominal Supply Current** | 500 mA During Operation |
| **Maximum Power Draw** | 2.25 W During Operation |

| Intrusion Protection | IP67 IEC60529 |
|---|---|
| **Operational Temperature Range** | 0 to 40 °C |
| **Storage Temperature Range** | -20 to 70 °C |
| **Humidity** | 5 to 95 % Non-Condensing |

Dimensional drawings: 24.58mm (0.97"), 76.2mm (3.0"), 74.6mm (2.9"), BACK, FRONT
2X Mount +1.28 mm (0.05"), 10.7mm(0.42"), 2X Mounting Holes Ø3.8mm Ø (0.15")
10.7mm(0.42"), 88.9mm (3.5"), 2X Mounting Holes Ø3.8mm Ø (0.15"), 85.2mm (3.35"), 106.68mm (4.2"), 37.59.9mm (1.5"), 2X Mount +1.28 mm (0.05")

CE