# CNC Touch Probe

M4, ±X ±Y −Z, 0.002 mm 2$\sigma$, 50 µs response

**TP1-W-R**

## HIGHLIGHTS

- High repeatability, 0.002 mm 2$\sigma$ (0.00008 in)
- Five measuring directions, ±X, ±Y, −Z
- Power and signal via one 8 m, 4-wire cable with flying leads
- TOUCH_NO or TOUCH_NC wire sets the NO or NC output function
- No receiver or battery: PNP output connects directly to the skip input
- Compact size, Ø1.614 × 2.480"




| Parameter | Value |
|---|---|
| Model No. | TP1-W-R |
| Connection | Radial cable (flying leads) |

## APPLICATIONS

- Multidirectional measurement
- Workpiece measurement
- Tool measurement
- Broken tool detection
- Tool wear measurement
- Tool length measurement
- Tool diameter measurement
- Thermal axis compensation
- Low- and high-volume production

## PRODUCT OVERVIEW

The TP1-W-R is a general-purpose, wired touch-trigger probe designed for a wide range of workpiece setup and tool measurement applications on CNC machines. It provides 0.002 mm 2$\sigma$ repeatability (30 mm stylus), with a kinematic 3-point seat that returns the stylus to the same rest position after every deflection.

The unit is housed in a compact, IP65-sealed body with an M4 stylus thread, a Ø12h7 mounting pin, and an 8 m, 4-wire cable with flying leads at the radial outlet. Two of its wires carry the 5–24 V DC supply, the other two the PNP TOUCH output. Either TOUCH_NO or TOUCH_NC connects directly to the skip input of the machine control.

## KEY FEATURES

| Feature | Advantages |
|---|---|
| 0.002 mm 2$\sigma$ repeatability | A kinematic 3-point seat returns the stylus to the same rest position after every deflection for precise probing in ±X, ±Y, and −Z. |
| No receiver or battery required | All signals run directly through the output cable. A PNP-compatible skip input is all that is needed for probing — no receiver, no batteries. |
| IP65 sealed body | Dust-tight and protected against water jets according to IEC 60529. |
| NO and NC wire output | TOUCH_NO and TOUCH_NC wires with PNP switching provide broad compatibility with Fanuc, Haas, Siemens, Mazak, and other CNC controls. |

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## MECHANICAL SPECIFICATIONS

| Parameter | Conditions | Value | Unit |
|---|---|---|---|
| Measuring directions | - | ±X, ±Y, −Z | - |
| Repeatability, $2\sigma$ | Stylus length 30 mm | 0.002 | mm |
| Measuring force, XY | Stylus length 30 mm | 2 | N |
| Measuring force, Z | Stylus length 30 mm | 6 | N |
| Stylus overtravel, XY | - | ±10 | ° |
| Stylus overtravel, Z | - | 4.5 | mm |
| Maximum probing speed | - | 2 | m/min |
| Stylus thread | - | M4 | - |
| Degree of protection | IEC 60529 | IP65 | - |
| Probe weight | - | 260 | g |

## ELECTRICAL SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Supply voltage, DC | - | 5 | - | 24 | V |
| Current consumption | - | - | - | 100 | mA |
| Output current | - | - | - | 200 | mA |
| Response time | On stylus deflection and return | - | 50 | - | µs |

## ABSOLUTE MAXIMUM RATINGS

| Parameter | Value |
|---|---|
| Operating temperature | +10 °C to +40 °C |
| Storage temperature | −20 °C to +70 °C |
| Supply voltage, DC | 24 V |
| Output current | 200 mA |
| Stylus overtravel, XY | ±10° |
| Stylus overtravel, Z | 4.5 mm |

*Permanent damage may occur if any of these limits are exceeded.*

## CONNECTIONS

| Model | Cable | Conductors | Output Signals |
|---|---|---|---|
| TP1-W-R | 8 m, radial outlet, flying leads | 4 × 0.25 mm$^2$ | TOUCH_NO, TOUCH_NC |

## OUTPUT CONFIGURATION

| Setting | Value |
|---|---|
| Output type | PNP |
| Output function | NO or NC |
| Selected by | TOUCH_NO or TOUCH_NC wire |

## WIRE ASSIGNMENT

| Color | Signal |
|---|---|
| White | GND |
| Brown | VCC |
| Yellow | TOUCH_NO |
| Green | TOUCH_NC |

## TYPICAL PERFORMANCE CURVES

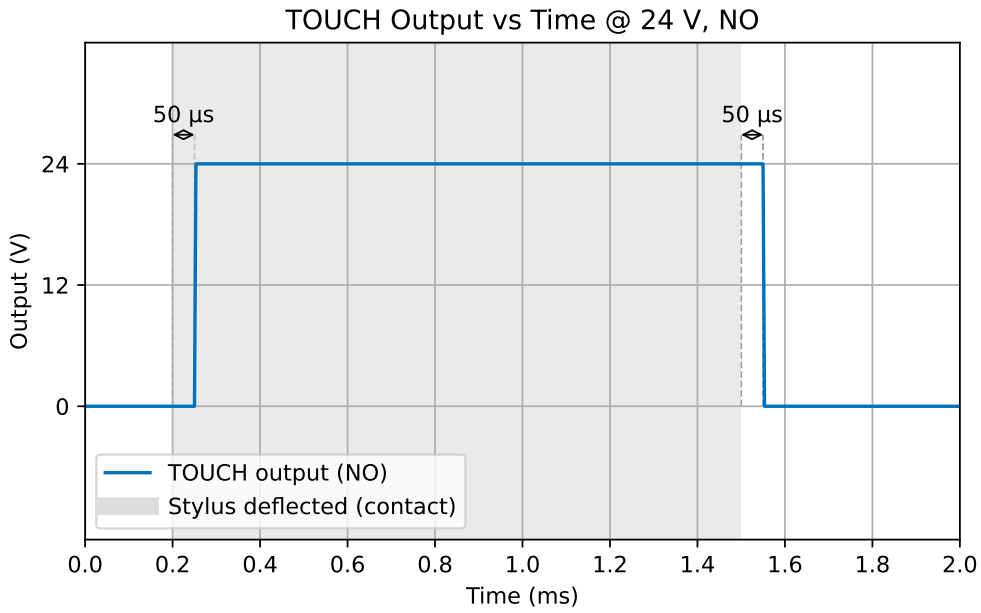



**Figure 1:** Output vs. Time

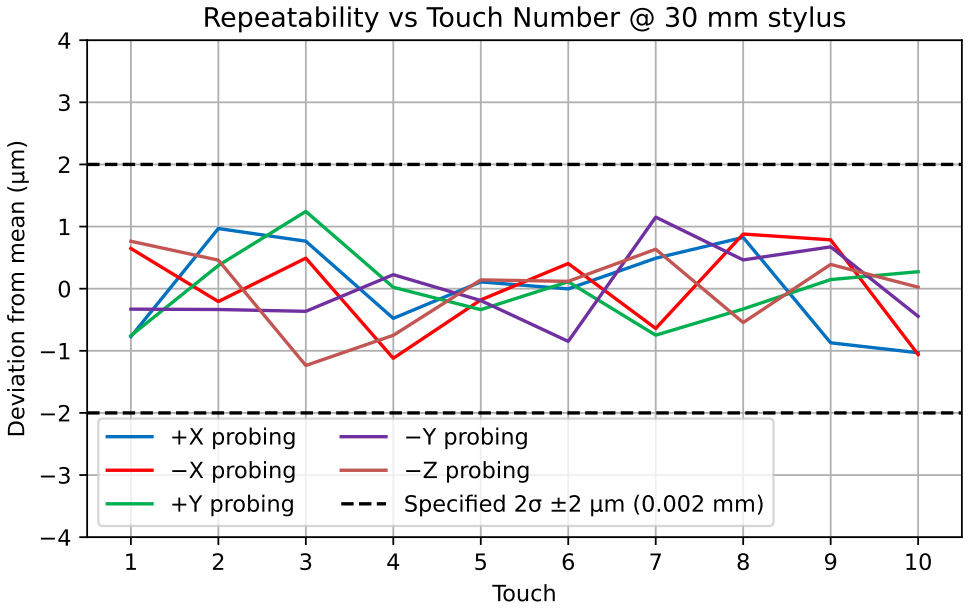



**Figure 2:** Repeatability vs. Touch Number

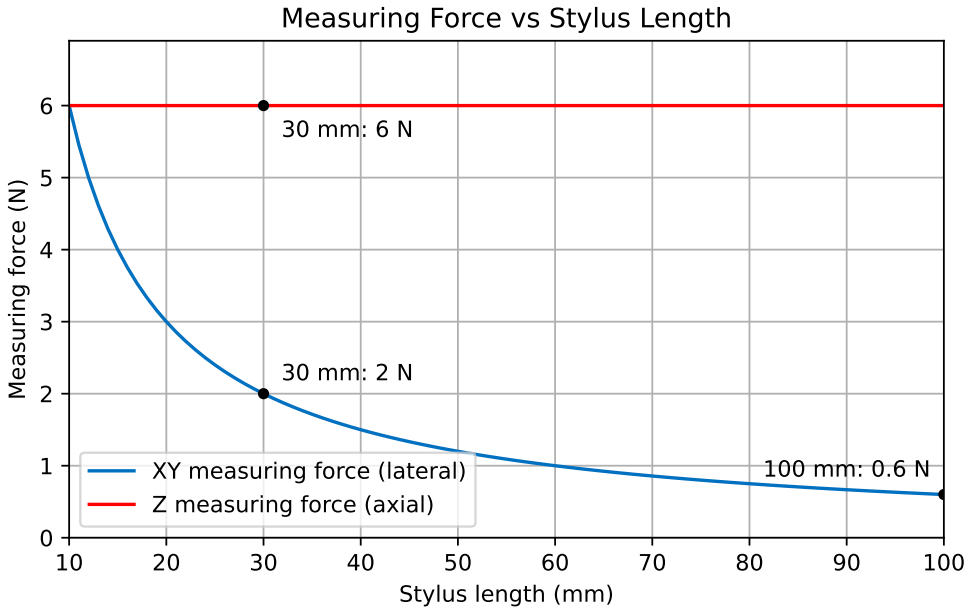



**Figure 3:** Measuring Force vs. Stylus Length

## WEB INTERFACE (WEBUI)

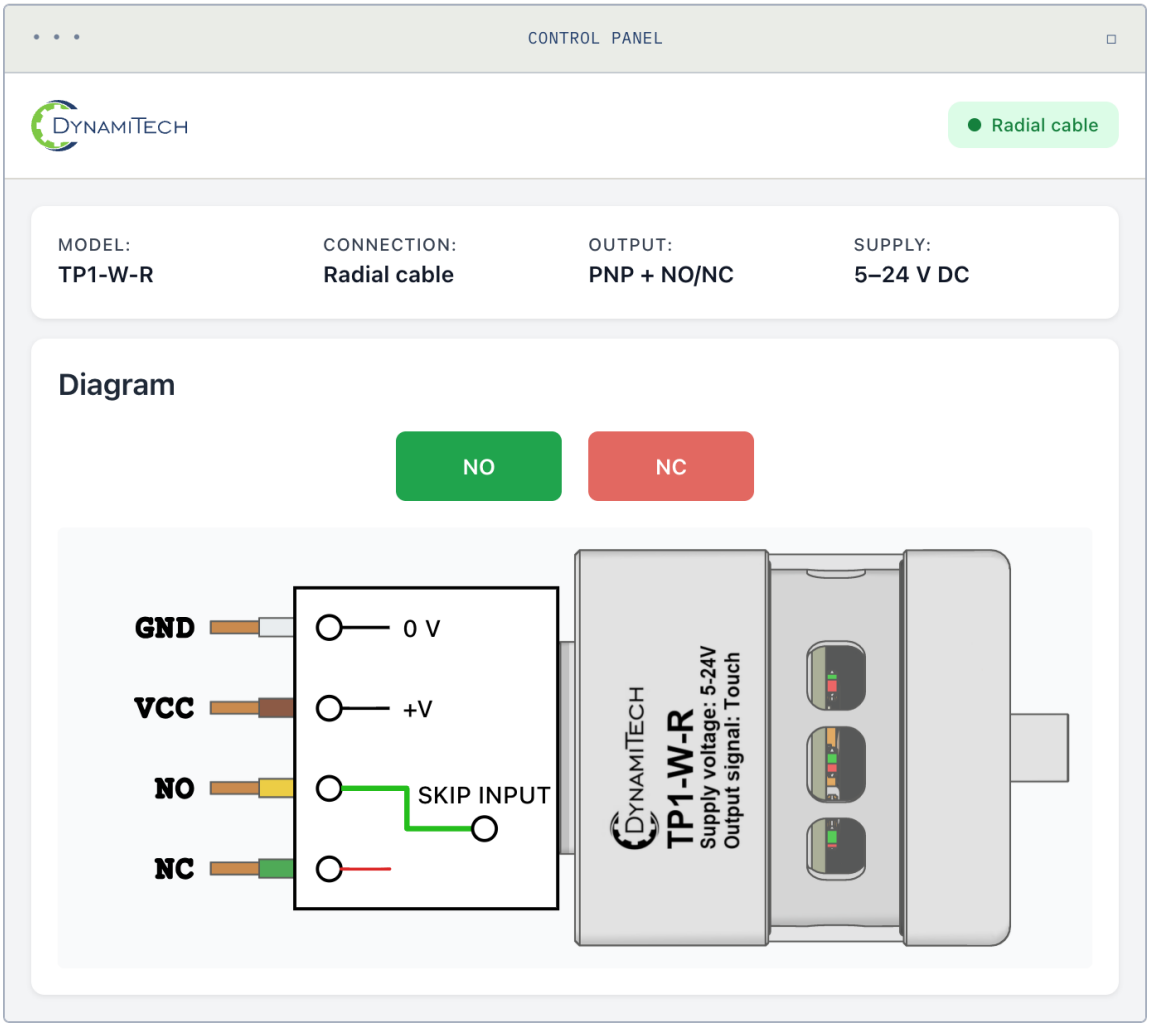



**Figure 4:** Web Interface (WebUI)