



ToolSens8 User's manual

Version: v1.00



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1. Introduction

The ToolSens8 Laser Tool Measurement Sensor is a precision optical sensor designed for automated tool detection and measurement in CNC machines. This device offers a compact and accurate solution to ensure precise tool measurements during CNC operation and setup. It integrates seamlessly into automated machining systems to improve efficiency and production quality.

Why is it useful?

In CNC operations, maintaining precise tool dimensions and positioning is critical to ensure consistent machining quality. The ToolSens8 sensor automatically detects and measures the tool length with a high degree of accuracy (± 0.001 mm), eliminating manual inspection errors and reducing downtime. It can also measure diameter with advanced but intuitive probing cycles. Its non-contact laser measurement system enhances the longevity of both the sensor and the tools by minimizing wear and contamination. Non-contact means that it doesn't need to touch the measuring surface, which means there is no risk of fracture of the already fragile cutting edge.

2. Features

- High-precision laser measurement (± 0.001 mm)
- Wide diameter detection range (0.05–8.00 mm)
- No physical contact with tool — reduces wear and contamination
- Compact design suitable for integration into all kinds of CNC machines
- IP50-rated housing for dust resistance
- Low air pressure cleaning during measuring – avoids tool damage while ensuring clean measurements

Benefits:

- Increased production efficiency by automating tool measurement
- Reduced tool breakage and wear due to early detection of anomalies
- Enhanced product quality with consistent machining precision
- Lower maintenance cost due to laser sensor and increased tool life
- Simplified integration into existing CNC systems

3. Technical specifications

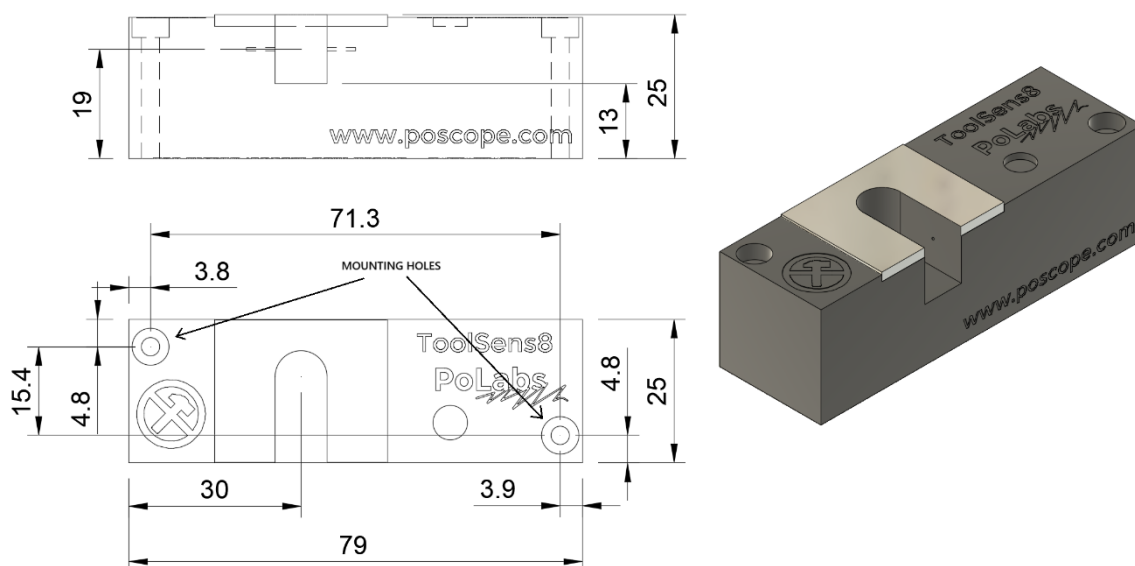
Specification	Details
Model	ToolSens8
Operating Temperature	10°C ~ 40°C
Protection Class (IP)	IP50
Measurement Diameter Range	0.05 mm ~ 8.00 mm
Measurement Accuracy	±0.001 mm
Sensor Lifetime	5 years (continuous operation, no external damage)

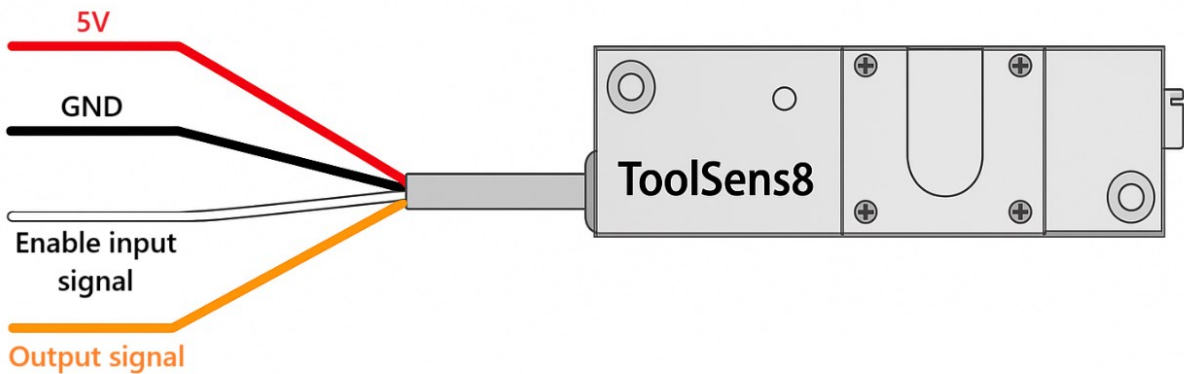
Wire Color	Signal Name	Function
Black	GND	Ground line – 0 V
Red	5 V	Power supply line – 5 V
White	Enable input signal	Activates the sensor
Orange	Output signal	Push-pull output 0 V / 5 V with 10 mA sink/source capability, 1.5 us rise time

Enable input signal	Laser beam	Output signal
0 V	Interrupted	0 V
0 V	Not interrupted	5 V
5 V	-	0 V
Ni priključen	-	0 V

3.1. ToolSens8 dimensions

Measurements are in mm.





3.2. Maintenance

The lens of the laser needs cleaning. Due to dust and chips in the CNC environment fine particles accumulate on the lens. The laser inside the ToolSens is protected with glass cover so nothing can get inside the device. It is still recommended to clean glass lens with pressured air (gently blow on the lens) or wiping the lens with fiber cloth or cotton swab.

When lens are not clean, the red LED on the housing (beam interruption indicator) will flicker because of the lens contamination.

3.3. Air tool cleaning

ToolSens8 enables the user to use compressed air to clean tool when measuring. It uses 4mm quick fitting to connect air supply to the sensor. The compressed air has to be switched with outside solenoid/unit so it is supplied only when measuring.



3.4. Mach3 & Mach4 settings

For Mach settings please check out the following blog posts:

<https://blog.poscope.com/mach4-probing/>

<https://blog.poscope.com/cnc-tool-setter-with-pokeys-and-mach4/>

Both are for probing and tool setting but they also have information about different G-codes that are used in probing cycles and for setting the appropriate tool offsets in Mach.

4. Errata information

5. Change log

V1.00 initial revision

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