

# LICENSING OPPORTUNITY: POSITION VERIFICATION SENSOR WITH DISCRETE OUTPUT

## DESCRIPTION

### Problem

In the industrial robotics industry, there is a growing need for more precise robot workcells. This includes the robots themselves, and surrounding equipment. Over the lifetime of a robot workcell, elements degrade, and their positioning may become less precise and the relative position between elements in repeated tasks may drift. To maintain precision, maintenance is required on robots and may come in the form of replacement of components or recalibration of systems. To maximize efficiency of a manufacturing or other automated operation, maintenance should be optimized. Therefore, there is a need to measure and track degradation of positioning precision.

### Invention

A sensor and key are paired with one another; when they interact in a very specific way a positive signal is produced. When a key is presented (physically moved to interact) to the sensor or the sensor is presented to the key, the geometry and interaction between the key and the sensor dictate the output of the sensor with a positive or absence of a positive signal (negative signal). If the key is presented and positioned within a designed tolerance the

sensor returns a positive signal, if the key is presented in a position outside of the designed tolerance, no signal is returned.

## BENEFITS

### Commercial Application

This invention was developed to provide a cost effective and relatively easy-to-integrate sensor to the manufacturing community that can be deployed, along with an accompanying method, to detect changes in the precision of the position of elements within workcells. Discrete sensors provide an easy to integrate solution and the design of the invention should be relatively cheap to produce at scale. The method for using the sensor in systems is being developed concurrently with the sensor but is not specific to the sensor design in this disclosure. At a fundamental level, the sensor can be thought of as an automated gauge.

### Competitive Advantage

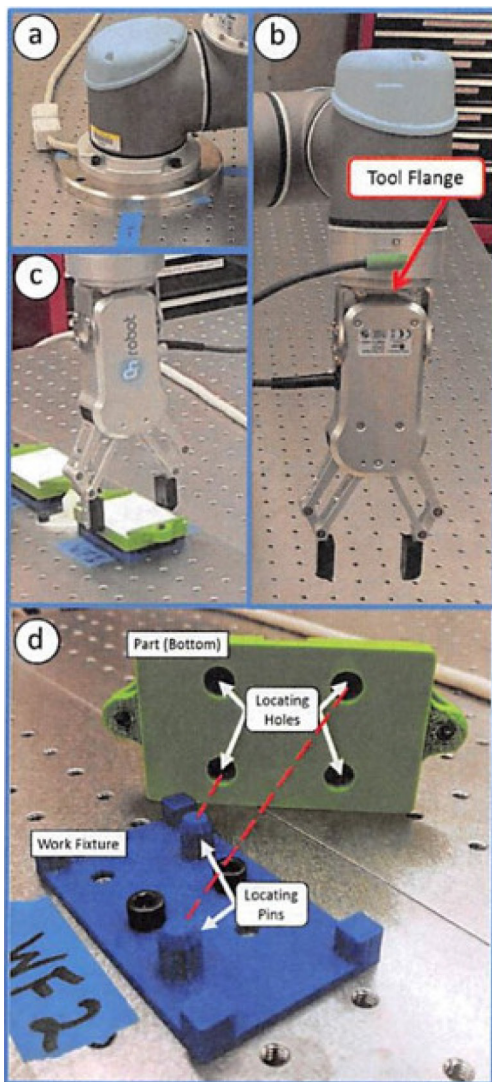
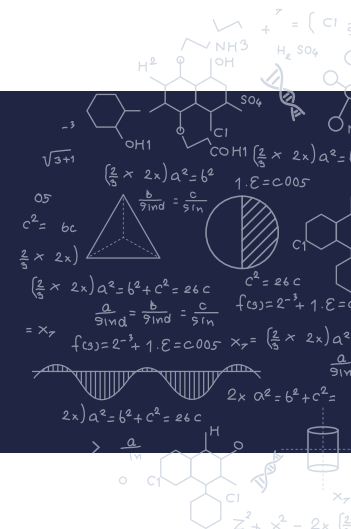
This technology has the potential to aid U.S. manufacturers in deploying low cost degradation monitoring systems within robot workcells and beyond. This technology could be commercialized in the form of a small low-cost sensor which is usable throughout a variety of automation systems.

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NIST use case on position verification for multi-robot work cell.

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