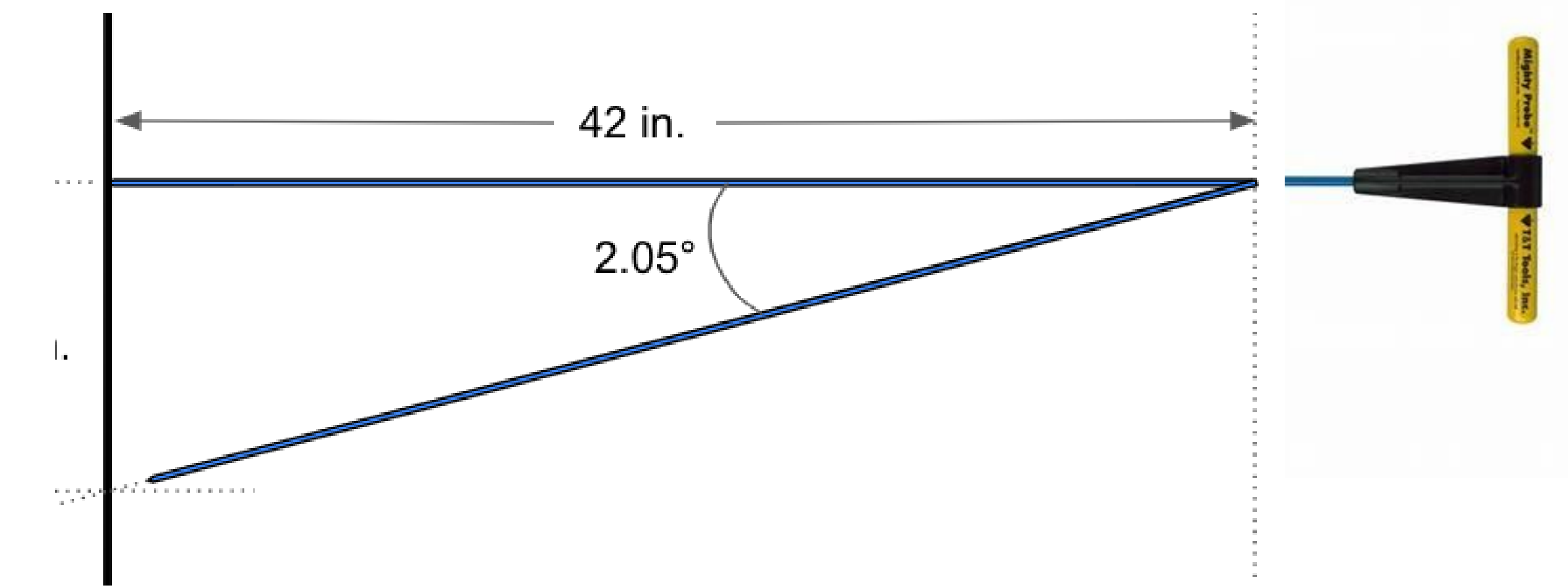


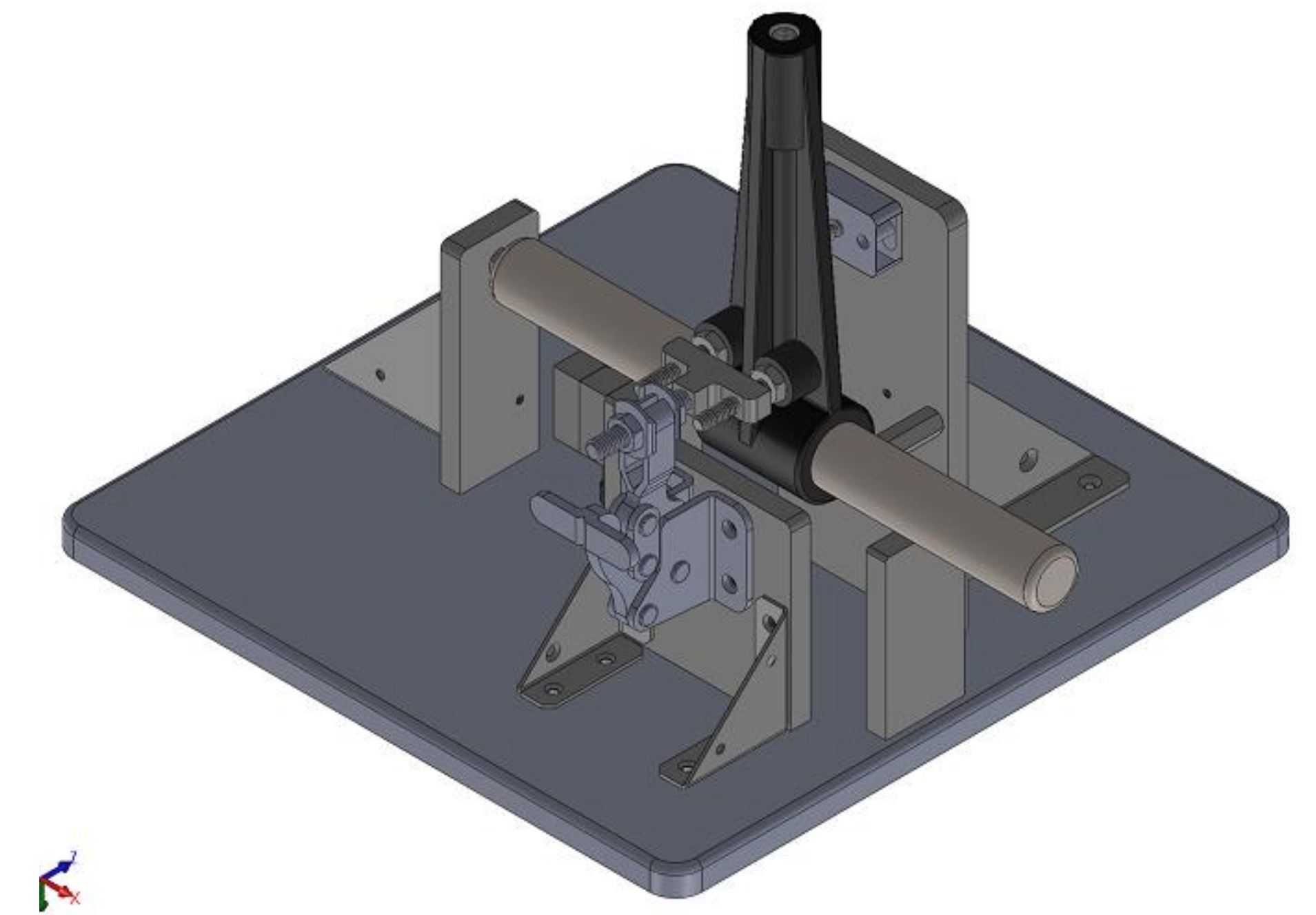
# Mighty Probe Handle Alignment Inspection Device

**EGR 485/486 Senior Project 2022**



## Problem statement

T&T Tools uses an overmolding process to make the Mighty Probe handle. During that process, the composite around the threaded insert tends to cool unevenly causing the insert to be out of square to the 1 inch OD steel grip. T&T Tools currently conducts 100% testing on their Mighty Probes for this critical feature. For the current inspection, the Mighty Probe's T-shaped handle is being inspected with a go/no go jig to hold half of the handle to measure the angle out of the square. The current go/no go jig is a manual setup saying if the deflection of the rod is over 2.05 degree, the handle is considered out of specifications. The operator often takes 30 seconds to set up the jig, load the T-handle, thread the rod in, inspect, and unload the parts. To address this problem, a new method of the inspection was designed. The team approach is to quantify the measurement by an inclinometer and apply the statistical control process, acquire data through PLC and visualize if the threaded insert met the specification



## Key Project Specifications

- Lower the cycle time of the inspection
- Visualize information with HMI screen
- Fit the product within 4x3 ft area
- Verify the equipment Gage R&R

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## Device description

A dual axis inclinometer is employed to measure the angle out of square of the T-Handle. The dual axis inclinometer captures the two plane angles that the threaded insert is oriented. To perform the measurement, the operator will use a pin of the inclinometer assembly and place it into the threaded insert on the T-Handle. The angle out of square will be captured to the PLC when the operator pushes a button. A screen prompts the angle results and tells the operator if the part meets the specification. Data recorded could be used to run a Gage Repeatability & Reproducibility, or a repeatability test to tell how the operation is doing and suggest corrective actions for T&T Tools.

## Challenges

- Designing around tight tolerance part
- Delays on electrical components
- Ordering extra parts
- Losing communication with PLC

