SPACE Lab Capstone IL-030 Test Procedure

Date: _____ / _____ / _____ _____:_____

yyyy mm dd hh ii

Part Number: _____ S/N: _____

Initials: _____, _____, _____,

_____, _____, _____

Test Result: _____

Test Objective

Verify through testing that the IL-030 laser rangefinder measures displacements with a resolution of at least 10E-6 m and an uncertainty of at most 5E-6 m. By stepping a CNC target at 12.7E-6 m increments a total of 1 to 100 steps over the span of five tests, minimum resolution and maximum uncertainty will be determined.

Equipment Required

Qty	Description	Specs/Calibration	Check
1	*IL-030 Laser Rangefinder*		
1	*Rangefinder mount*		
1	*CNC Target*		
1	*CNC Mill Table*	*Step size less than 15 um*	
1	*Oscilloscope*	*Aka scope*	
1	*Laptop*		

Test Plan

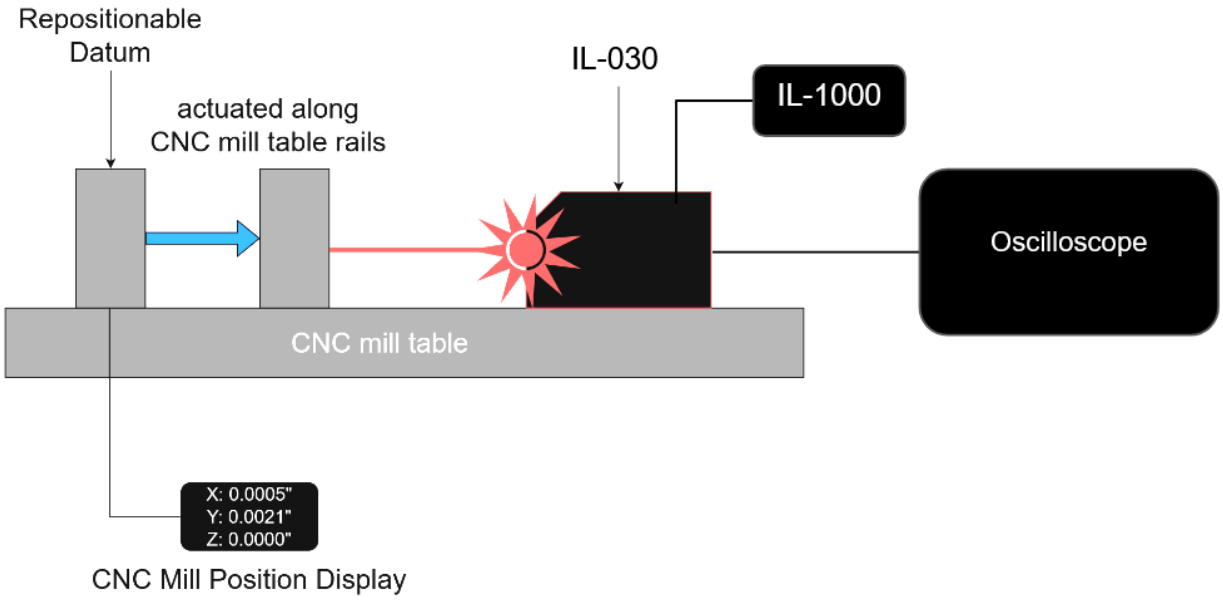

Figure 1: Test Setup

1 Setup

Zero the position of the CNC mill. OK? _____
Place CNC target in mill vice. OK? _____
Attach the rangefinder to the mount. OK? _____
Attach the rangefinder mount to the CNC table so that rangefinder is spaced ~2 mm from target.
MEASURED _____
Verify rangefinder has clear line-of-sight to the target. OK? _____
Plug power supply V+ into IL-1000 brown wire. OK? _____
Plug power supply V- into IL-1000 blue wire. OK? _____
Plug IL-030 wire bundle into IL-1000 port. OK? _____
Plug IL-030 data transmission wire into scope. OK? _____

2 Preliminary Safety Checks

Confirm there are no shorts in IL-1000 wiring. OK? _____
Confirm power supply wiring is not shorted. OK? _____
Confirm the mill is not powered. OK? _____

3 Power Up

Plug power supply into wall outlet. OK? _____
Confirm that IL-1000 displays the same numerical value in both green and red. OK? _____

4 Test

Begin recording on the scope. OK? _____
Move the target on the CNC vice by one step. OK? _____
Repeat step distance for 99 more steps. OK? _____
Record the first CNC step distance at which a displacement is detected by the IL-030.
MEASURED _____
Save recorded data file to laptop as .csv with file name “IL-030 Test Data”. OK? _____

5 Post Test

Check that recorded distances to not have significant outliers greater than an order of magnitude higher than that called for by the CNC table OK? _____
IF true, repeat procedure starting from Section 1.
Upload “IL-030 Test Data” file to Capstone Google Drive. OK? _____

6 Shut Down

Unplug the IL-1000’s power supply from the wall. OK? _____
Disconnect the scope from the IL-1000. OK? _____
Disconnect the IL-030 and IL-1000 from each other. OK? _____
Remove the rangefinder from the mount and place both into storage container. OK? _____
Remove the target from the CNC vice. OK? _____

Change Log

Ver	Date	By	E-mail	Change
1.0	4/26/2024	Winston Wilhere Lillie LaPlace	wilhere@uw.edu llapla@uw.edu	Initial release.