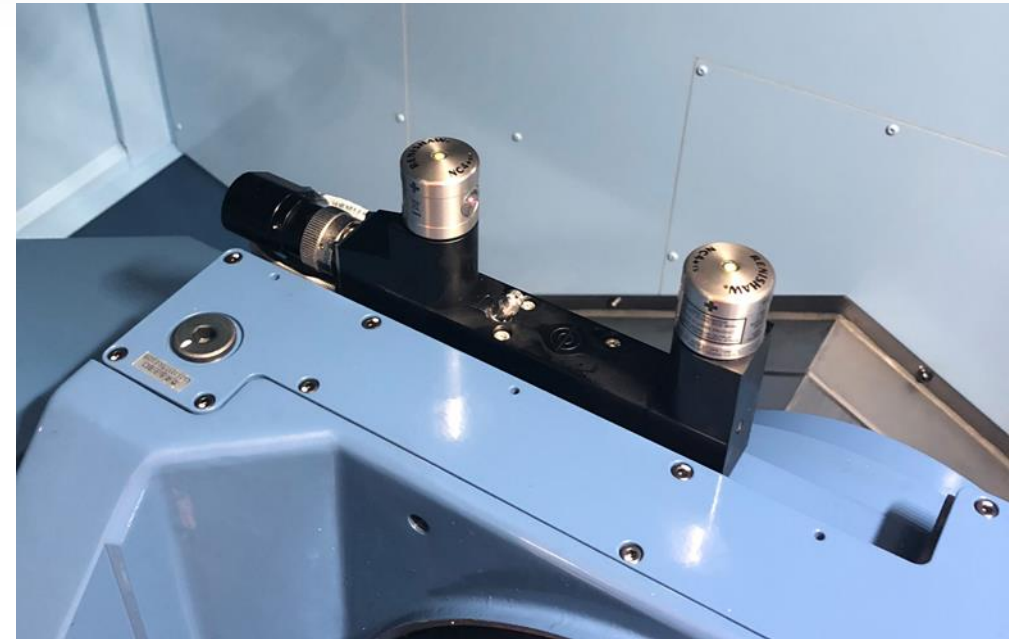


# Non-Contact Tool Setting

NC4+



This presentation will give you step by step instructions on (re)aligning and (re)calibrating your laser tool setting system

# Table of Content:

- Vertical Machines:

- Status LEDs ..... Slide 4
- Adjustment..... Slide 5
  - Spindle Axis ..... Slide 6
- Calibration ..... Slide 8

## Maintenance:

- Troubleshooting..... Slide 9

# Vertical Alignment LED status



Renishaw NC4+ Blue

Probe status LED	
Blocked beam / probe triggered	●
Partially blocked beam / probe untriggered	●
Unblocked beam / probe untriggered	●

- Fixed Renishaw laser systems, at rest, should always have Green LEDs
- If you have a NC4+ Blue, your status light should be BLUE
  - If they are any other color consult the 'Basic Troubleshooting Slide'

Renishaw NC4+

Red = no signal

Amber = some signal

Green = good signal



# Fixed system adjustment



```
(LASER ALIGNMENT)
(ALIGNMENT ERROR IN #102)
G28G91Z0
G00G40G80G90
G53X-12.8Y-26.46
#3006=150 (MOVE TOOL INTO POSITION)
G65P9860T1B1.D2.K5.00012R.62543A-22.30Z.15
M30
```

- If you make any adjustments to your laser, you **must** run O8060 (alignment cycle) **then** O8061 (calibration cycle)
- When to align the laser:
  - You hit / bump the laser bracket.
  - If you think the system may have shifted / moved.
  - A change in the machines Grid Shift or Spindle
- Run O8060
  - Use caution when Manually driving the Laser Tool to the beam, as you may be able to crash into the laser body!
  - Looking at the LEDs change its status to 'Broken Beam' with the tool, then slightly back out, restoring the original LED status

# Spindle Axis



- Check Var #102 for the alignment along the spindle axis. This value should be less than +/- .0005 in.
- To adjust along the spindle axis, you must adjust the level of the base. It will be adjusted with a set screw/cap screw type setup.
- When adjusting with a M3 Alan-wrench, make sure to loosen first then tighten the opposite.



- Make slight adjustments Hitting cycle start and repeat until #102 is an acceptable value
- Check that your Cap and Set Screws are snug. Run it one more time to ensure you still have good numbers
- If #100 and #102 are acceptable you **MUST** now run O8061
  - #100 is the angle of the laser on the table, our angle beam software compensates for this value

**PANEL** The gap check neglect parameter is set to ON. Be careful  
061 when operating.

13:37:49 iHMI S1-OVR:100%

MEM

Custom Macro Variable

#1		#100		#500	
Number	Value	Number	Value	Number	Value
100	-45.2147244361	111	1.96850393701	122	2.0000
101	-0.00374766594	112	3.14960629921	123	3.0000
102	0.0007	113	2.0000	124	0.00019685039
103	10000.0000	114	2.0000	125	0.0000
104	11000.0000	115	0.1000	126	1.0000
105	12000.0000	116	4.9998	127	236.220472441
106	13000.0000	117		128	118.11023622
107		118	0.00007874016	129	0.03937007874
108	3.0000	119	5000.0000	130	-11.4929681357
109	1.0000	120	520.0000	131	4.82044383202
110	10.4330708661	121	1.0000	132	

Running

NC Opera Program Mgr Tool Ofs

Work Crd PrgList Macro

IPC M CODE

IPCLevel M-Counter PalletMoni

Utility RENISHAW AlarmHis

Setup

Maintenance

Number Search Name Search File Input File Output

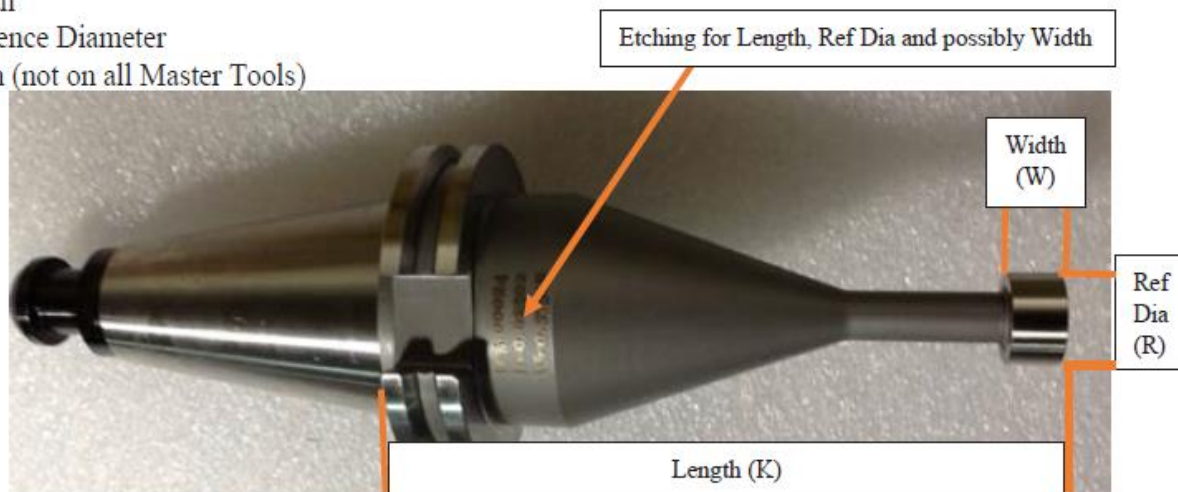
BDT2 BDT3 BDT4 BDT5 BDT6 BDT7 BDT8 BDT9

# Calibration



- Double check that all values match your master tool exactly:
    - K (tool length)
    - R (reference tool diameter)
    - W (tool width)
    - Y (tool radius – .055 in)
  - Run O8061
  - After calibration Var #520-#531 are populated (This depends on the O9460 or O9760 settings program. The program number will depend on the age of Renishaw software).
- O9760 = TSM1(push in measurement)  
or
  - O9460 = TSM2(pull out measurement)) will be updated with the Laser Calibration values.
    - #120=520(BASE NUMBER)
  - Do **NOT** overwrite the values in these macro variables with your own cycles.
  - Now your laser is ready to use.

K= Length  
R= Reference Diameter  
W=Width (not on all Master Tools)



(LASER CALIBRATION)

```
G91G28Z0  
G90G80G49G40G0  
G65P9861B1.T1K5.00012R.62543Z.15  
G65P9861B1.T1K5.00012R.62543Z.15Y.272W.37436  
M30
```

\*\*\*Some versions of software may have only one line in the calibration program.

(LASER CALIBRATION)

```
G91G28Z0  
G90G80G49G40G0  
G65P9861B1.T1K5.00012R.62543Z.15Y.272W.37436  
M30
```



# Basic Troubleshooting



- If you have Red LED status
  - Check to see machine air is ON and air is coming out of laser heads
  - Check to see if Transmitting laser is hitting the Receiving head on center
- Amber LEDs
  - Re-align and Re-Calibrate laser
- Green / Amber rapidly flashing LEDs
  - Switch the set-up Switch 2 on the laser interface (slide 6) for 5 seconds and then switch back.
- Is the laser-beam a 'shotgun pattern' not a 'pin-point'
  - Clean laser heads
- LEDs on laser won't turn on
  - Contact PQI
    - Office: 763-249-7149
    - Toll Free: 800-772-0620