

# 1) Calibrate SF fingers

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*DISCLAIMER: It's not easy to do, but it's possible that driving a hand past where it's supposed to be driven can cause damage. It's recommended that while your hand is uncalibrated and you are moving the fingers you should be ready to pull the plug or flip the switch if the motors drive too far and start jamming.*

## Initiate calibration

Power the hand and connect the USB cable. Then the code needs to be run and the finger calibration code needs to be run (/calibrate\_fingers service)

```
roslaunch reflex reflex_sf.launch
(in a new terminal)
rosservice call /reflex_sf/calibrate_fingers
```

After calibration is running, **go back to the window where reflex\_sf.launch was run**. You'll see a series of prompts, which will ask you to tighten (t / tt) or loosen (l / ll) each motor. When you get each motor to the place you want, hit 'q' to move on to the next motor.

```

/home/sarah/catkin_ws/src/reflex-ros-pkg/reflex/launch/reflex_sf.launch http://localhost:11311
/home/sarah/catkin_ws/src/reflex-ros-pkg/reflex/launch/reflex_sf.i... * sarah@ubuntu: ~/catkin_ws/src
[INFO] [WallTime: 1440691332.317190] Controller reflex_sf_preshape successfully
started.
[reflex_sf_controller_spawner-4] process has finished cleanly
log files: /home/sarah/.ros/log/f97e839c-4cd4-11e5-82bb-5891cf1f2fca/reflex_sf_co
ntroller_spawner-4*.log
[INFO] [WallTime: 1440691333.637328] Starting up the hand
[INFO] [WallTime: 1440691333.712650] Reflex hand has started, waiting for comman
ds...
[INFO] [WallTime: 1440691520.675860] Calibrating motor /reflex_sf_f1
Type 't' to tighten motor, 'l' to loosen motor, or 'q' to indicate that the zero
point has been reached
t
Tightening motor /reflex_sf_f1
Tighten: 't' Loosen: 'l' Done: 'q'
t
Tightening motor /reflex_sf_f1
Tighten: 't' Loosen: 'l' Done: 'q'
l
Loosening motor /reflex_sf_f1
Tighten: 't' Loosen: 'l' Done: 'q'
q
[INFO] [WallTime: 1440691555.673108] Saving current position for /reflex_sf_f1 as the zero point
[INFO] [WallTime: 1440691555.674867] Calibrating motor /reflex_sf_f2
Type 't' to tighten motor, 'l' to loosen motor, or 'q' to indicate that the zero point has been reached
t
Tightening motor /reflex_sf_f2
Tighten: 't' Loosen: 'l' Done: 'q'
tt
Tightening motor /reflex_sf_f2
Tighten: 't' Loosen: 'l' Done: 'q'
ll
Loosening motor /reflex_sf_f2
Tighten: 't' Loosen: 'l' Done: 'q'

```

## What's actually happening

Unlike the Reflex Takktile hand, the SF doesn't have any sensor feedback. Whereas the Takktile hand uses encoders to automatically calibrate the fingers, with the SF we need to position the motors by hand and then tell the code to save that motor position as the "zero" point.

These values are saved in the reflex/yaml/reflex\_sf\_zero\_points.yaml file when you run the /calibrate\_fingers service. That means calibration doesn't need to happen often (the values are saved) but should be done if you detach the finger tendons/spools or if the tendons stretch.

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