

## 2) Configuring the Tactile Sensors

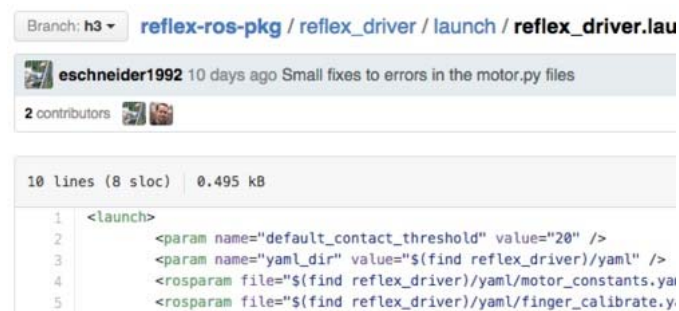
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The next tutorial is [3\) Calibrate Takktile fingers](#)

### *What is "Contact"?*

There are behaviors you can enable with the hand that check whether a finger is in "contact" with something. When tactile stops are enabled, and the hand is commanded to close, the fingers will close until contact is detected. But what is "contact"? Is a finger in contact when it brushes an object? Or when it's clamped on an object?

The simple answer is that there are threshold sensor values for the pressure deviation that are counted as contact. The default value as of writing is 20, as shown in the `reflex_driver` launch file here:



This threshold value means that if the sensed tactile changes by more than 20 from where it was zeroed, that sensor will report that it is in contact. If the user lowers the threshold, perhaps to 10 or 7, it will take much less pressure to cause the hand to report contact. If the user wants to grip something firmly, they could raise the threshold value to make it take more force before reporting contact.

### *How to change the default sensitivity*

If you quit any terminals running the `reflex_takktile.launch` `roslaunch` command and edit the `reflex_driver/launch/reflex_driver.launch` file, you can change the `default_contact_threshold` value.

```

rosed reflex_driver reflex_driver.launch
(Edit the contact_threshold value and save file)
roslaunch reflex reflex_takktile.launch

```

After editing, rerun the code. You should be able to see the effect your change made on the contact variable. Don't forget to periodically re-zero the tactile sensors. Here's the link to [how to zero the tactile sensors](#) if needed.

If you lower the threshold value you should see the sensors report contact at a light touch, and if you raise the threshold it should take more force before the sensors report contact.

### *How to set each sensor's threshold individually!*

The method described above is how to change the default contact threshold, the one that is set for each sensor at the beginning of a launch. To set the threshold for each sensor individually we use the `/set_tactile_threshold` service. This service takes the `SetTactileThreshold` service message in the `reflex_msgs` package, which has three arrays, one per finger, with nine elements in each array, one per sensor. You can call the service from the terminal like so:

```

(In a new terminal)
rosservice call /reflex_takktile/set_tactile_threshold "finger:
- sensor: [10, 10, 10, 10, 10, 10, 10, 10, 10]
- sensor: [20, 20, 20, 20, 20, 10, 10, 10, 10]
- sensor: [10, 10, 10, 10, 10, 30, 30, 30, 30]"

```

The easiest way to use the terminal is to enter the command above up through "set\_tactile\_threshold", and then hit the tab key so that the "finger: ..." command auto-generates correctly.

Try setting the thresholds of the sensors to a variety of values, and play with the sensors to see the effect of the thresholds.

There are a couple different use cases here.

- Disable broken sensor
  - If a sensor is broken and giving bogus values, you could fix the situation by resetting the thresholds so that the broken one has a high value, e.g. 1000. No matter what the bogus sensor value is, the finger will not register contact from it.
- Set up variable thresholds for better grasps
  - Perhaps in order to get a good grasp you want the finger to stop if the proximal link experiences light pressure, or if the distal link experiences heavy pressure. Setting the threshold values for each sensor allows you to do this easily.
- Ignore contact from certain sensors
  - Similarly, perhaps you want the finger to stop *only* on distal contact. Just set the proximal thresholds to be very high and the distal thresholds to be normal - then when tactile stops are enabled the finger will stop only on distal contact

**You're encouraged to pause and play around with different tactile thresholds to get a feel for how the hand will sense contact.**

Keep on going to [3\) Calibrate Tactile fingers](#)

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