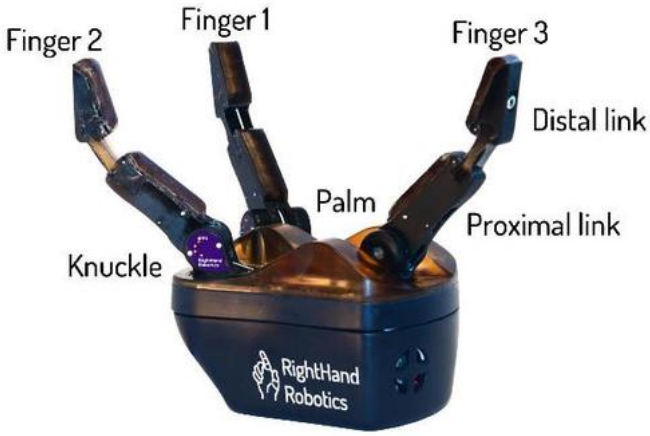
Reflex SF Quickstart

Introduction

This page will walk you through the components and capabilities of the Reflex SF hand, then go through how to get the basic Hello World functionality working.



The ReFlex SF hand is an underactuated 4-DOF hand. The SF (sensor-free) doesn't have any sensor feedback except for some built-in sensors in the motors. The system is laid out at the hardware breakdown page. The Reflex Takktile is a separate product, with joint encoders and tactile sensors, if you have a Takktile hand check out the Takktile quickstart page.

Setting up the software

These instructions assume you are using a fresh install of Ubuntu 14.04
1) Install ROS according to the official ROS instructions for Ubuntu
2) Follow the ROS tutorials to set up your catkin workspace and configure your ROS install

OR

run the following lines to set up a basic workspace quickly.

```
echo 'source /opt/ros/jade/setup.bash'  >> ~/.bashrc
source ~/.bashrc
mkdir -p ~/catkin_ws/src
cd ~/catkin_ws/src
catkin_init_workspace
cd ~/catkin_ws
catkin_make
echo 'source  ~/catkin_ws/devel/setup.bash'  >> ~/.bashrc
source ~/.bashrc
```

If you create your catkin workspace with our code, it's recommended that you check out the ROS tutorials later. They go step by step through the basic abilities of ROS, while at the same time give you ways to check that everything works.

Whether you've created your catkin workspace through the ROS tutorials or through our code pasted from above, it is recommended that you run the following lines. It's important to make sure that your catkin workspace setup document is in your bashrc before any ROS code will run.

```
echo 'source  ~/catkin_ws/devel/setup.bash'  >> ~/.bashrc
source ~/.bashrc
```

Download the ROS package

If you do not have git installed then install it:

```
sudo apt-get install git git-core
```

Add your user to the dialout group. If you don't do this, you will get messages saying you don't have permission to open the USB port. Make sure to insert your username in the appropriate spot, replacing 'your_username'. If you're unsure on your username, visit this site: cyberciti.biz/faq/appleosx-bsd-shell-script-get-current-user/

```
sudo adduser your_username dialout
```

Clone the RightHand Robotics code

```
cd ~/catkin_ws/src/
git clone https://github.com/arebgun/dynamixel_motor.git
git clone https://github.com/RightHandRobotics/reflex-ros-pkg.git
```

It's important to clone the folder into the src/ folder of your catkin workspace, or somewhere downstream of that, so that the code can be compiled with catkin_make.

Run the basic driver code

1) Make the host-side driver code
If you have problems getting catkin_make to work it's recommended to go through the ROS tutorials from the beginning. You might have missed a small step somewhere, and they lay it all out clearly. You can also visit our installing and building a package page for tips.

```
cd ~/catkin_ws/
catkin_make
```

Ignore any errors you see about tf and deprecated Quaternion usage. The tf code is from an older tutorial (hence the warning) but still works.
Check that all the necessary packages are available by trying to find the ReFlex ROS packages:

```
rospack find reflex_driver
rospack find reflex_msgs
rospack find reflex
```

If catkin_make worked, each rospack call should return the folder location of the package.

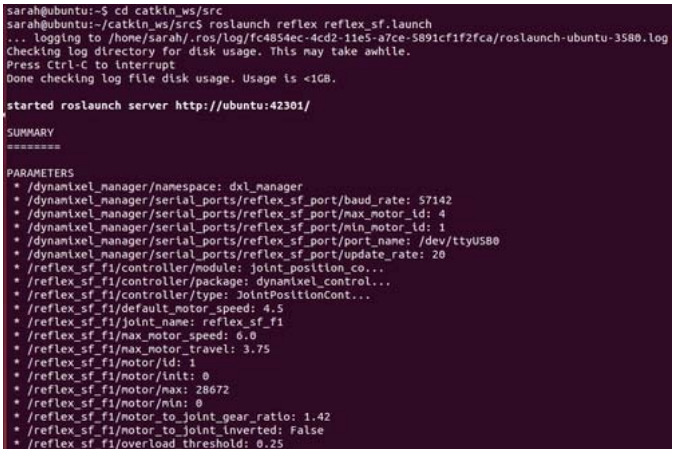
2) Power the hand!
As laid out in the hardware breakdown page, the hand uses a 12V power supply. If all the motors are stalling the hand could draw up to 5A (worst case) but for light testing we've been using power supplies that supply as low as 1.5A with no problems. The ReFlex hands (both SF and Takktile) take a simple barrel jack for power.

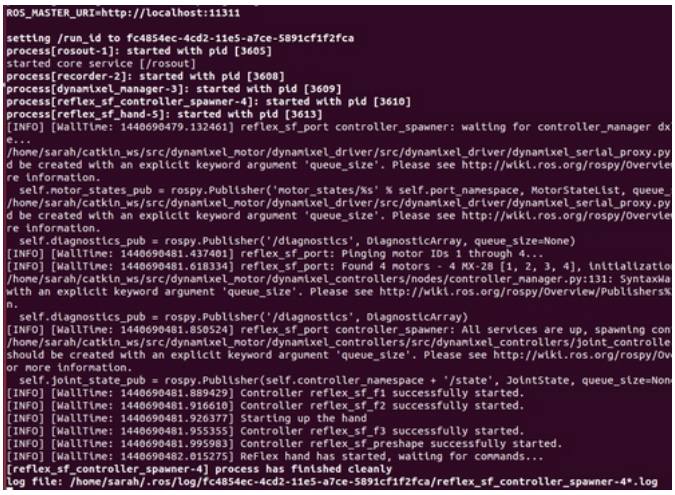
3) Now plug the USB cable from the hand into your computer.

4) Run the driver code:

```
roslaunch reflex reflex_sf.launch
```

It should look like so:





The code should be running at this point! The point of these drivers is to catch the USB traffic from the hand and bundle it into a formatted reflex_msgs/Hand message. You can check that the message is publishing by echoing the topic:

```
rostopic echo /reflex_sf/hand_state
```

If the topic is not published, then check the basic things - that the hand is plugged in, that the USB cable is well seated, etc. You can also check that the two board indicator LEDs are flickering quickly. Please check the troubleshooting page if the problem is not resolved.

Explore with our tutorials!

Visit our documentation page for a full list of available code, tutorials, and other information. We recommend you run through some of the basic tutorials to check all the parts of your system and get up to speed on the ReFlex hand.

The first tutorial is how to calibrate the SF fingers. Enjoy!

Mounting the hand on a robot

Instructions on how to mount the ReFlex on a robot are provided here.

Troubleshooting

For common problems and the related fixes, visit out troubleshooting page.

If any item of the tutorial took additional debugging beyond what's written, please send us a quick line at support@righthandrobotics.com so we can update the tutorial for the next users!

Add a New Comment