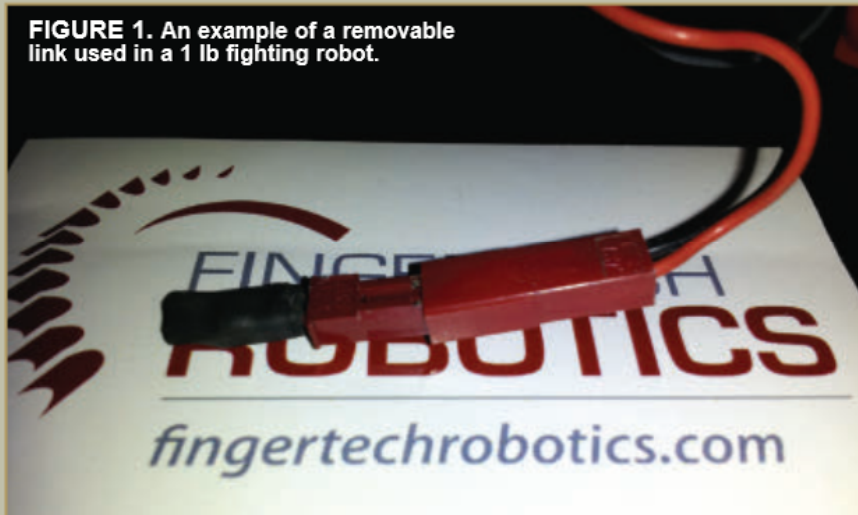


PARTS IS PARTS:

Product Review: FingerTech Robotics Power Switch

● by Mike Jeffries

FIGURE 1. An example of a removable link used in a 1 lb fighting robot.



For as long as I can remember, there hasn't been a power switch designed for the 150 g to 3 lb combat robot classes that is readily available. Most Insect class bots I've seen have used variations of a removable link concept, where a connector is used to split the line and the mating connector has the wires connected; when the mating connector is plugged in, the circuit is complete and the robot is powered.

This method works, but in practice is often slow and awkward to use. This method also means that there is the potential for the mating connector to get lost before a match or get knocked loose during a match.

Another option that I have seen is off-the-shelf slides, pushbuttons, and toggle switches. Once again, these work, but they tend to be fragile; without a mechanical lock, they are capable of being switched off purely from sudden acceleration.

I only started building Insect class robots a few years ago, but right from the beginning I knew I wanted a better power switch option. I even went to the effort of designing and building my own. However, they were too expensive to make on a commercial scale, so when I found out about the new switch FingerTech Robotics was working on, I knew I had to take a look at it.

The design is simple, light, and compact. As far as simplicity, there are only five distinct parts: two mirrored housing blocks, one through-hole copper tab,

one tapped copper tab, and a screw. As far as weight is concerned, the switch I tested weighed in at 2.2 g.

The switch is also small enough to fit into most Insect class robots at only 0.5 x 0.5 x 0.25" for the main body. With the price coming in under \$10, it's also a very good deal.

As delivered, the switch can either be used with 2-56 screws or tapped for 4-40 screws. The nylon housing taps easily and should be quite durable, as long as the screws are not over-tightened. For my tests I chose to tap the holes for 4-40 screws to allow easier installation and save some internal space in the 150 g test bot.

The switch was mounted flat in the chassis with the bolt head accessible from the side of the robot. The switch was mounted in this fashion for two reasons. The first is that it means the switch is easily accessible if the robot is inverted. The second is that the internal chassis dimension is 7/16", which means the switch would not fit if it were mounted vertically.

The switch has performed flawlessly in my own testing and all of the other testing that I am aware of. In addition to robot testing, the switch has also been load tested up to 57A for five minutes without failure. The switch was tested at 76A; however, the 12 gauge wires unsoldered themselves after just under two minutes. The switch itself failed after five minutes at 95A.

Given that the switch is intended for robots weighing up to 3 lbs, this provides a huge margin for even the highest powered 3 lb robots. The non-obvious

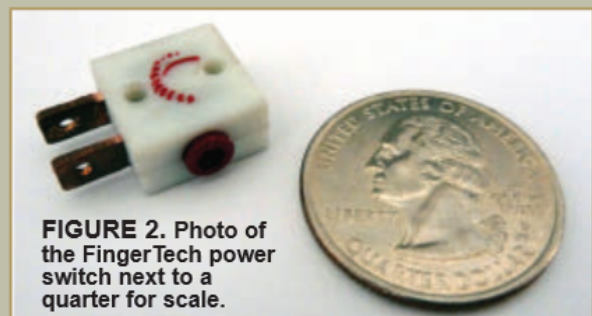


FIGURE 2. Photo of the FingerTech power switch next to a quarter for scale.

feature that greatly contributes to the reliability of the switch is the slightly undersized hole for the screw head. This arrangement results in a head that naturally resists rotation.

When this is combined with the contact method allowing for slight compression, it means you've got two forces acting to prevent the switch from accidentally turning on or off.

After testing the switch, I intend to use it in all of my future Insect class robots. **SV**

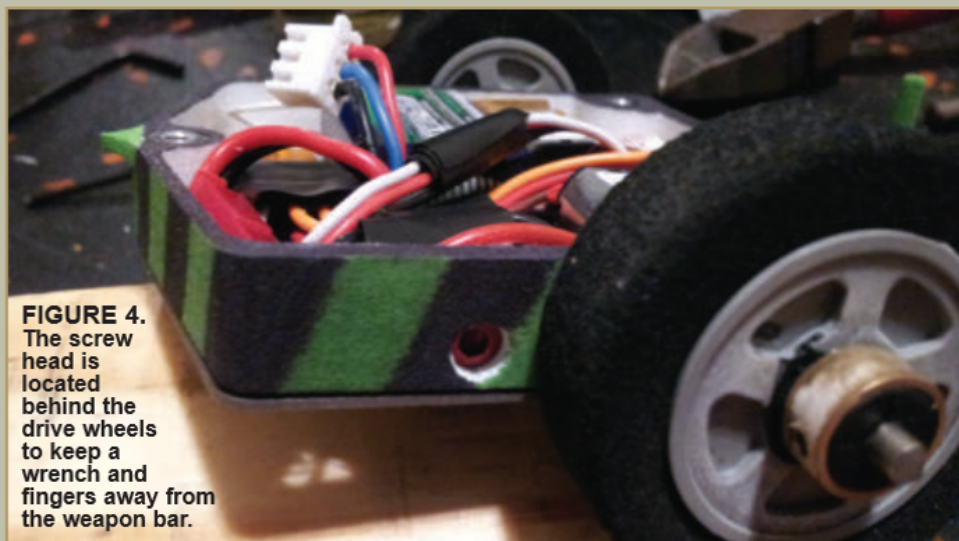


FIGURE 4. The screw head is located behind the drive wheels to keep a wrench and fingers away from the weapon bar.

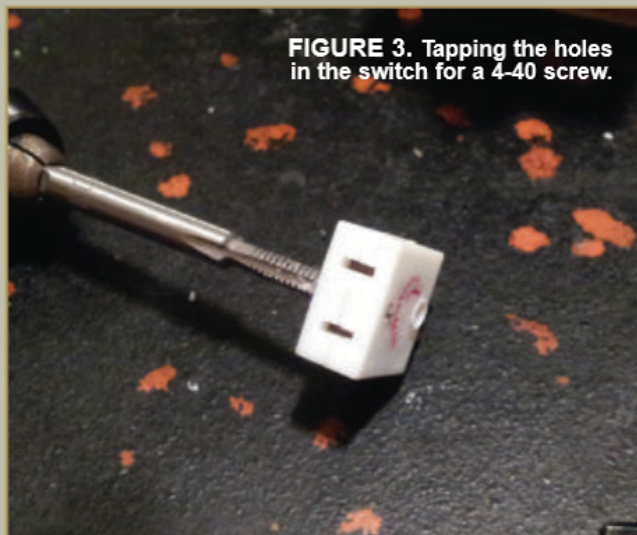


FIGURE 3. Tapping the holes in the switch for a 4-40 screw.

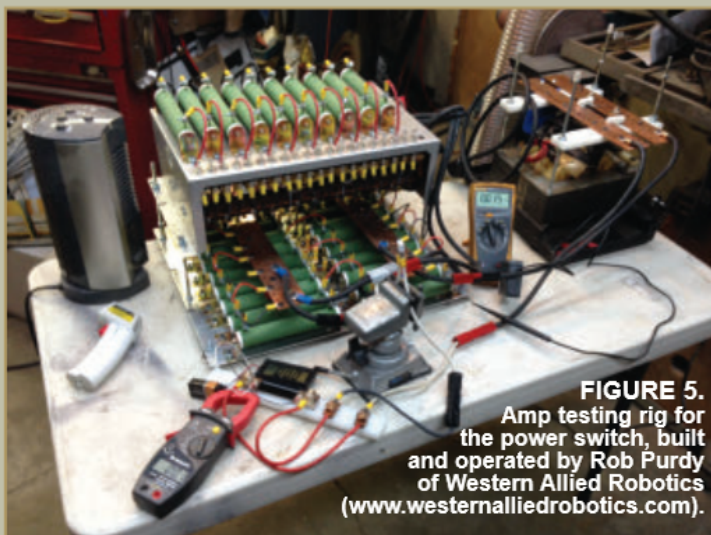


FIGURE 5. Amp testing rig for the power switch, built and operated by Rob Purdy of Western Allied Robotics (www.westernalliedrobotics.com).

Melty Brains

Bot CPR

by Kevin Berry

