Hands on with Lego Spike Prime

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Now that we have unboxed our Lego Spike Prime, we can get started. Lego made a neat video which you can see by scanning the QR code to the right or visiting this link.

When unboxing a new Lego Spike Prime, we might have noticed a few electronic parts. If we had a used box, have surely seen the electronic parts.

These Parts are the backbone of the Lego Spike Prime set. These parts are the following.

1. Lego Spike Prime Hub

   The Lego Spike Prime Hub are the brains of the whole set. See the Lego video about the hub on this link or scan de QR code on the right.

   The hub consists of the following parts:

Figure 2: Main hub

Figure 1: Sensor/actuator ports

The *main hub* shown in fig. 1 This part is where the microprocessor or 'brain' is located. This is where the code is stored and executed. On the hub we also find different ports and buttons, shown on fig 2 & 3.

Figure 3: Usb connection port

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Ports shown on fig 2. Are used to connect the different electronic components that will be explained in the next two chapters.

The port shown on fig 3. Is a micro-USB port and used for charging and uploading code to the hub.

There are also several buttons on the main hub. These are shown on fig 4.

Button 1: The power button, press and hold a second for the main hub to turn on. Press and hold for several seconds to turn off.

Button 2: Cycle the programs on the

Button 3: Bluetooth connect button. Press to enable Bluetooth and connect to the software

Figure 4: Power, selection & bluetooth buttons

Inside the main hub there is also an extra sensor, *the gyroscope*. The gyroscope can sense the main hub moving in three dimensions. This data can be accessed and used.

The *battery (fig 5)*. This part is inserted inside of the main hub. (see fig 6.) It powers the electronics and is replaceable if needed. The battery charges when the hub is connected to power by USB.

Figure 5: The battery

Figure 6: How to insert the battery

2. Lego Spike Prime Motors

Besides the Hub we have a few more electronic parts. Two of these parts look alike but are slightly different. These parts are the motors. These help the hub actuate and move(turn).

Lego made another neat video about these parts. See the video on this link or scan de QR code to the right.

The two types of motors are both used for slightly different purposes. The single *bigger motor* (fig 8.1) is used for heavier loads requiring more torque (turning power). The downside is a slight slower response rate. This type of motor is for example used in lifting weights or grabbing when used as a claw.

The two *smaller motors* (fig 8.2) are used for speedy, high response rate movement. Like for example moving wheels or small arms.

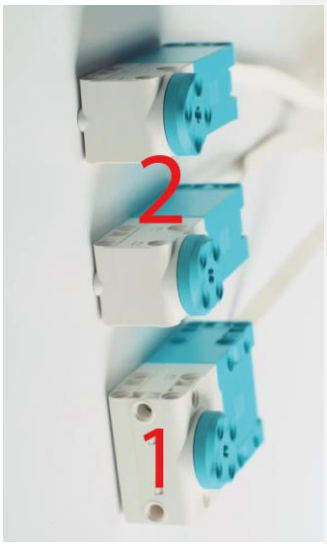

Figure 7: The two types of motors

3. Lego Spike Prime Sensors

The Lego Spike Prime set has three different sensors. They add different functions to the main hub. These functions are 'sensing' the world around the hub. Lego, as always, has made a video that can be seen on this link or viewed by scanning the QR code to the right.

Distance sensor

The *distance sensor* (fig 8) adds the capability of sensing objects to the hub. This is done by using ultrasonic waves. The usable range is between 1 and 200cm, with a divergence of +/-1cm. It also has lights around the sensors which are programmable.

Figure 8: The distance sensor

Color Sensor

The *color sensor* (fig 9) works like a camera. It measures reflected light. It can tell the color of the object held in front of the sensor. The optimal range is 16mm. The sensor can see eight different colors seen in fig 10.

Figure 9: The color sensor

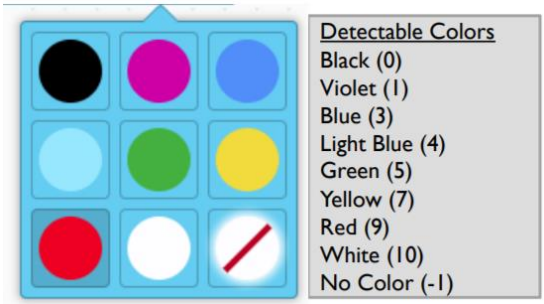

Figure 10: The detectable colors

Force Sensor

The *force sensor* (fig 11) almost works like a button. You can press it or use it as a bumper. It measures up to 10nM of force. The output of this sensor is always pressed (1) or not pressed (0).

Figure 11: The force sensor

For more technical information about the different sensors please see this link or scan the QR code to the right.

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