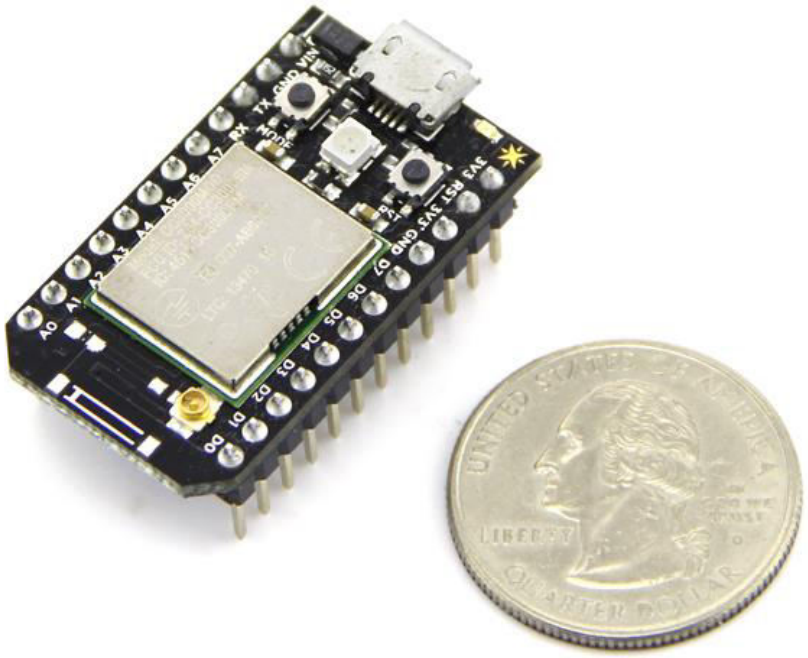
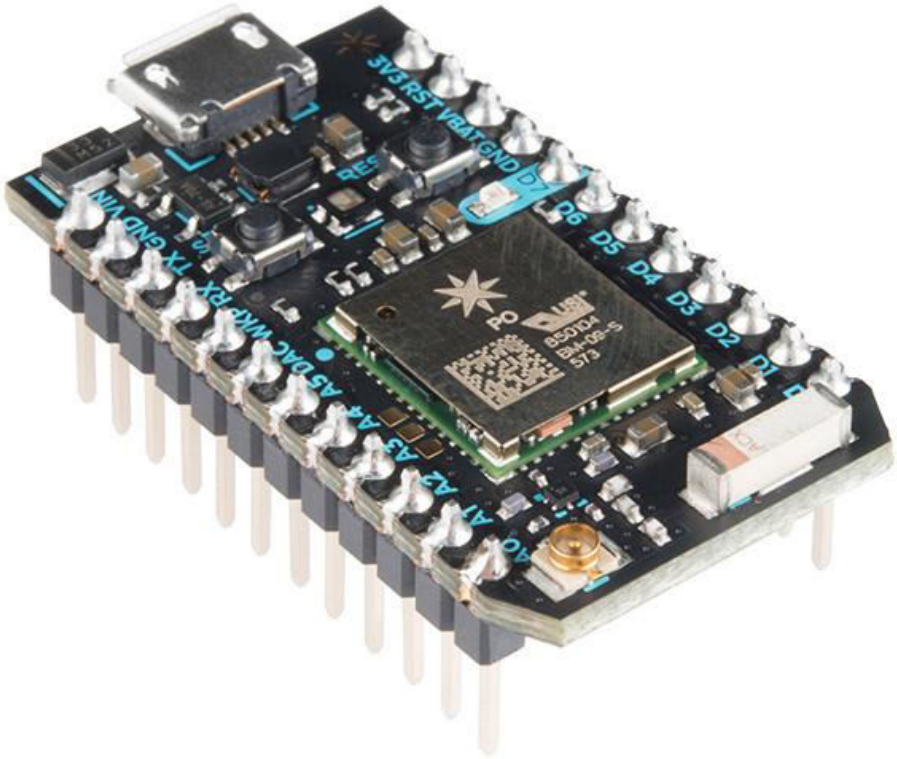
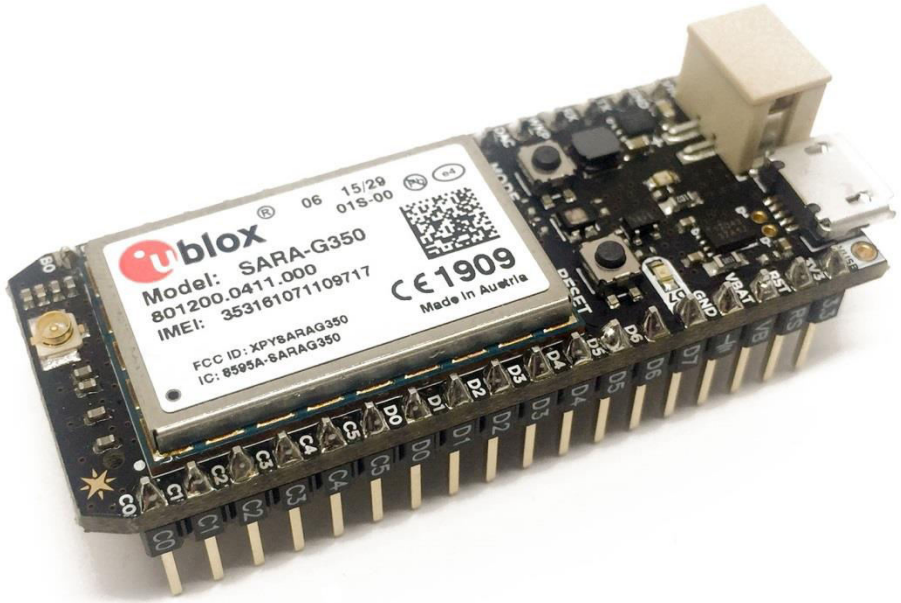
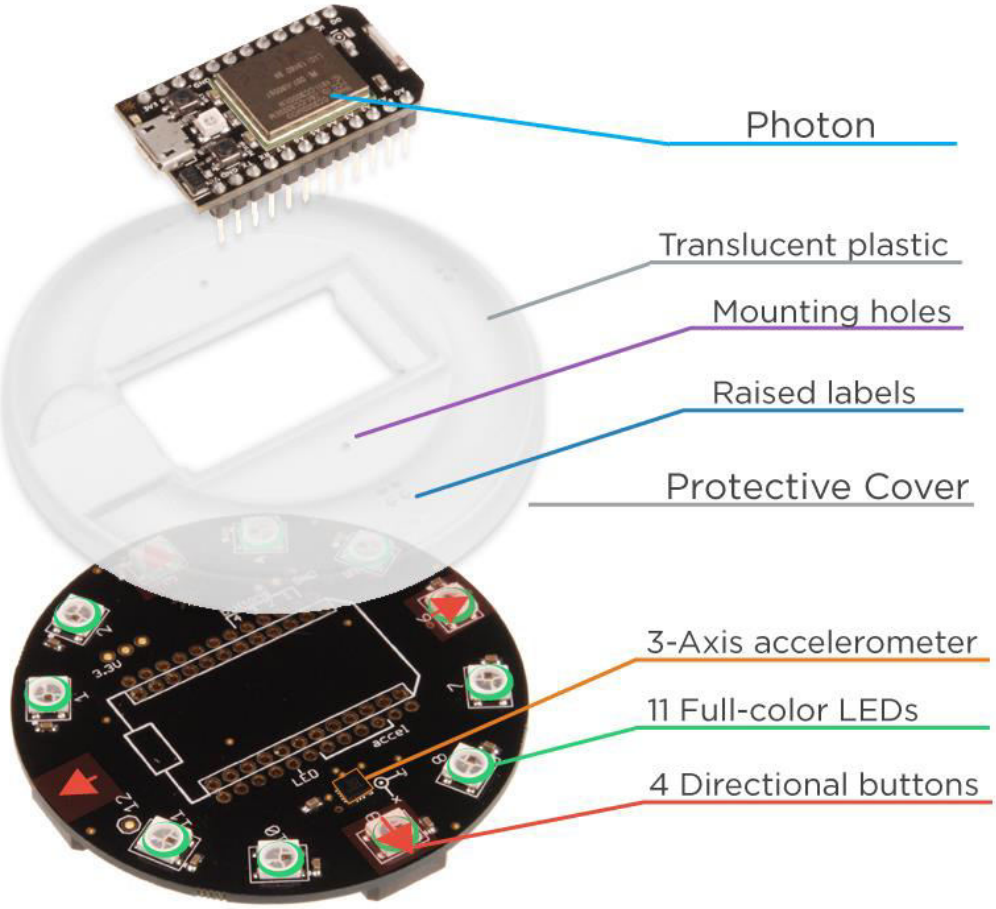
Chapter 1: Introducing IoT with Particle Photon and Electron

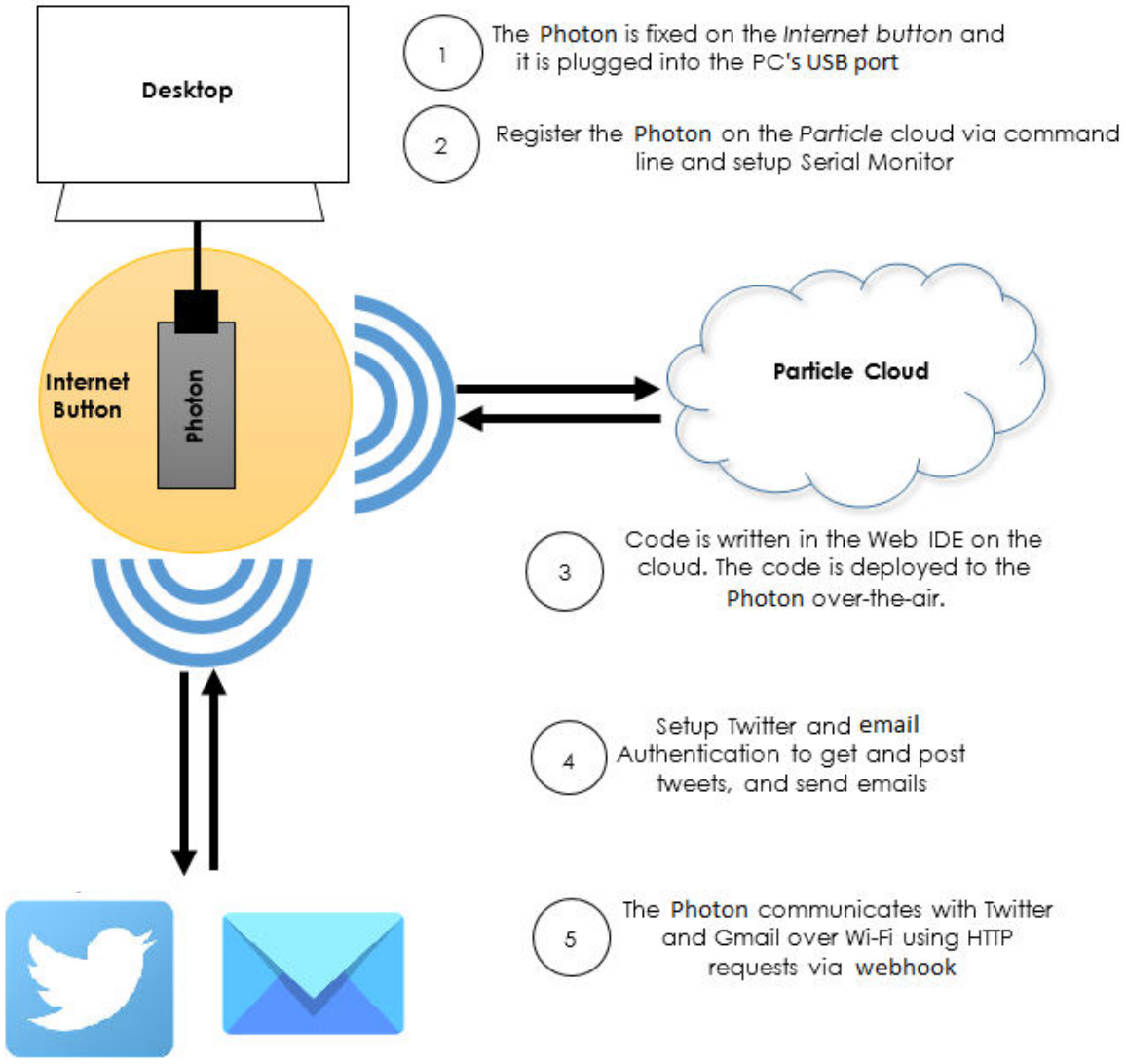


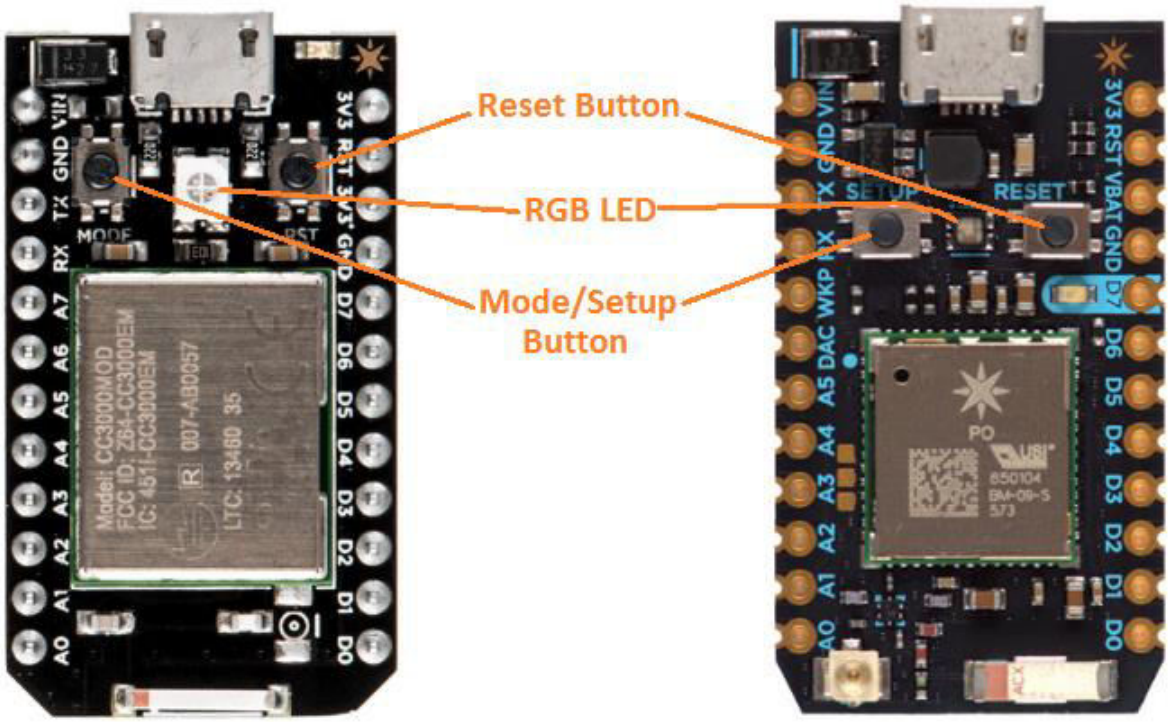

3V3 RST VBAT GND D7 D6 D5 D4 D3 D2 D1
VIN GND TX RX WKP DAC A5 A4 A3 A2 A1 A0
RES
P0
850104
BH-08-S
573

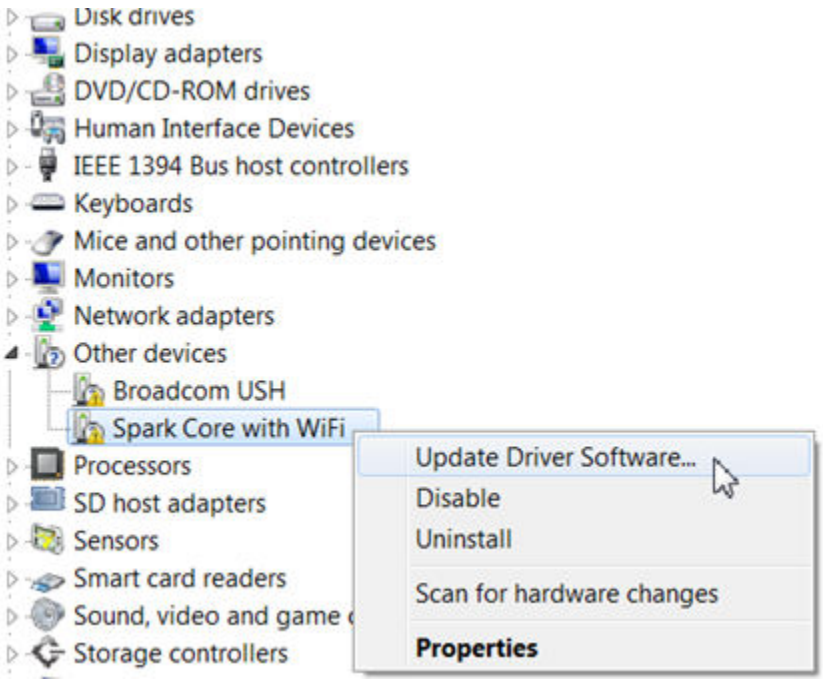

ublox
Model: SARA-G350
801200.0411.000
IMEI: 353161071109717
FCC ID: XPYSARAG350
IC: 8595A-SARAG350
Made in Austria
1909
RESET
GND
VBAT

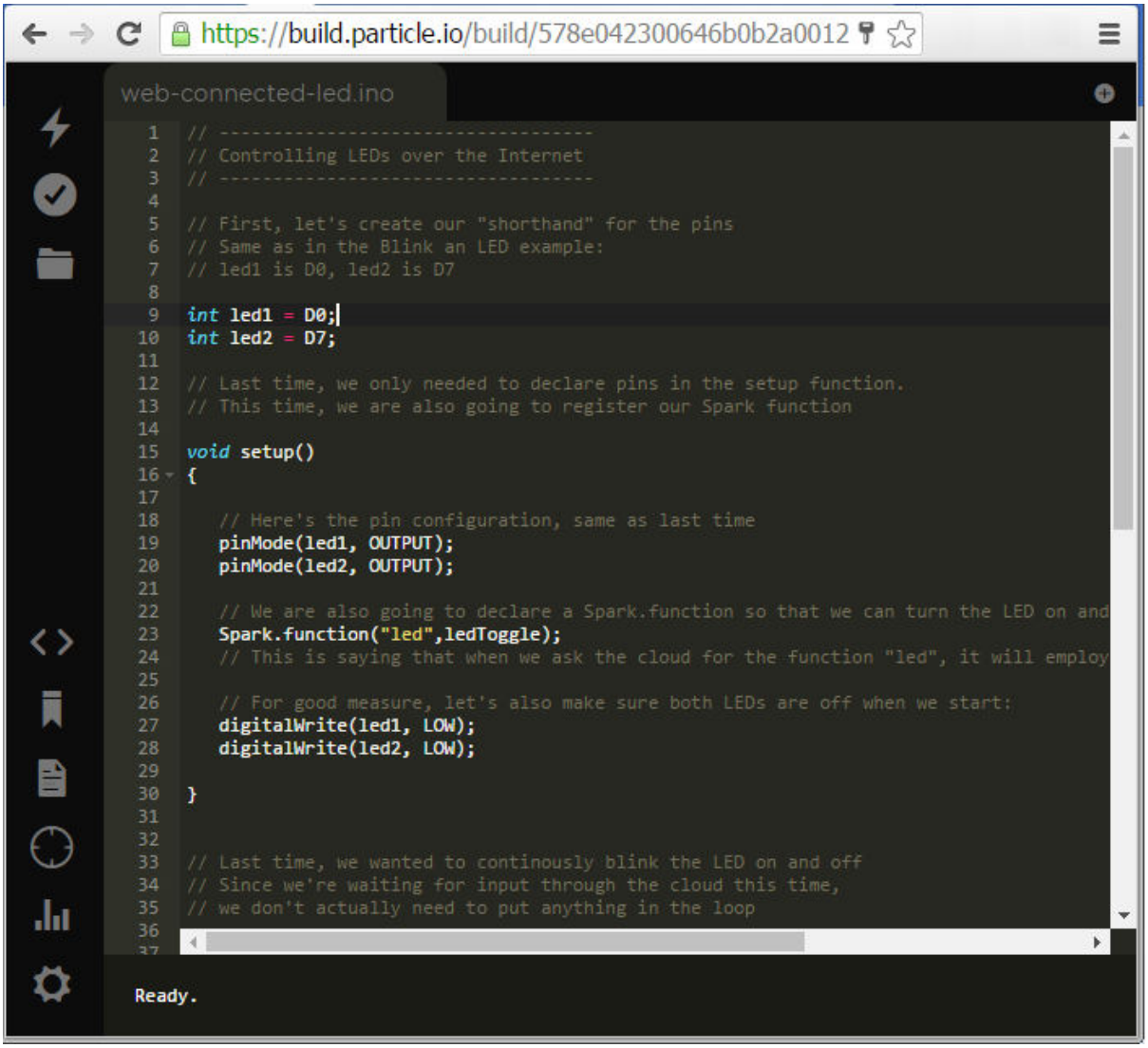
Chapter 2: Fire Up Your Kit




Desktop
Internet Button
Photon
Particle Cloud
1
The Photon is fixed on the Internet button and it is plugged into the PC's USB port
2
Register the Photon on the Particle cloud via command line and setup Serial Monitor
3
Code is written in the Web IDE on the cloud. The code is deployed to the Photon over-the-air.
4
Setup Twitter and email Authentication to get and post tweets, and send emails
5
The Photon communicates with Twitter and Gmail over Wi-Fi using HTTP requests via webhook

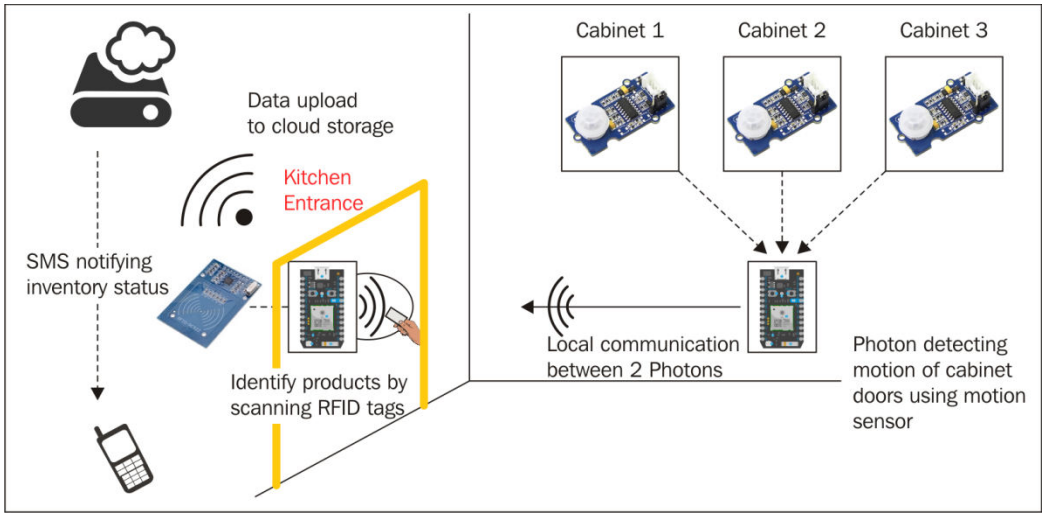

Reset Button
RGB LED
Mode/Setup
Button
Spark Core
Particle Photon

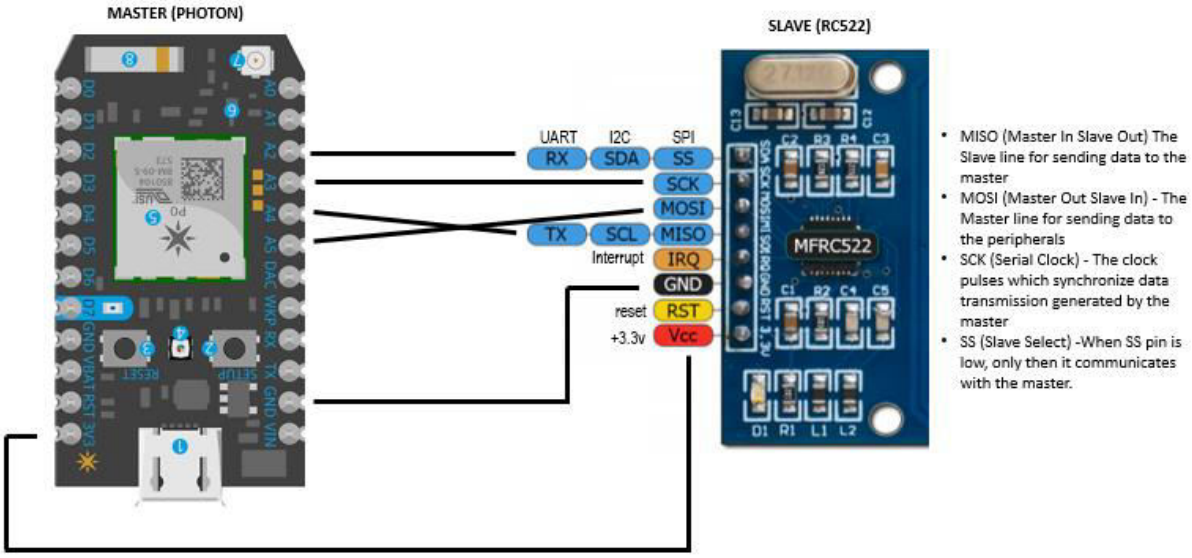

Disk drives
Display adapters
DVD/CD-ROM drives
Human Interface Devices
IEEE 1394 Bus host controllers
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Other devices
Broadcom USH
Spark Core with WiFi
Processors
SD host adapters
Sensors
Smart card readers
Storage controllers
Update Driver Software...
Disable
Uninstall
Scan for hardware changes
Properties


https://build.particle.io/build/578e042300646b0b2a0012
web-connected-led.ino
// ----------
// Controlling LEDs over the Internet
// ----------
// First, let's create our "shorthand" for the pins
// Same as in the Blink an LED example:
// led1 is D0, led2 is D7
int led1 = D0;
int led2 = D7;
// Last time, we only needed to declare pins in the setup function.
// This time, we are also going to register our Spark function
void setup()
{
// Here's the pin configuration, same as last time
pinMode(led1, OUTPUT);
pinMode(led2, OUTPUT);
// We are also going to declare a Spark.function so that we can turn the LED on and
Spark.function("led",ledToggle);
// This is saying that when we ask the cloud for the function "led", it will employ
// For good measure, let's also make sure both LEDs are off when we start:
digitalWrite(led1, LOW);
digitalWrite(led2, LOW);
}
// Last time, we wanted to continously blink the LED on and off
// Since we're waiting for input through the cloud this time,
// we don't actually need to put anything in the loop
Ready.

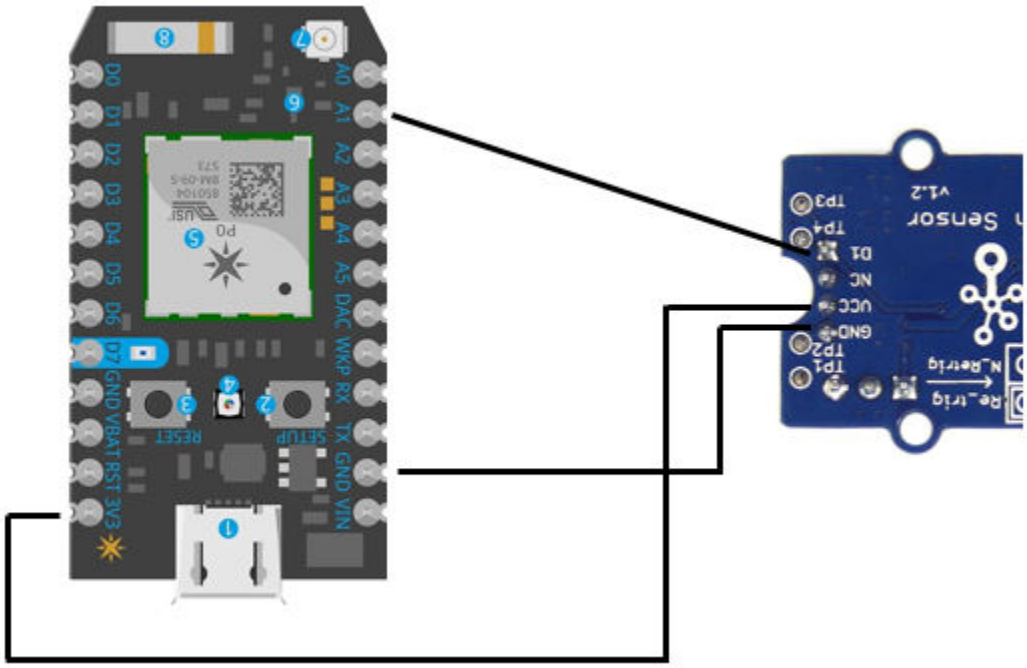
Chapter 3: P2P and Local Server

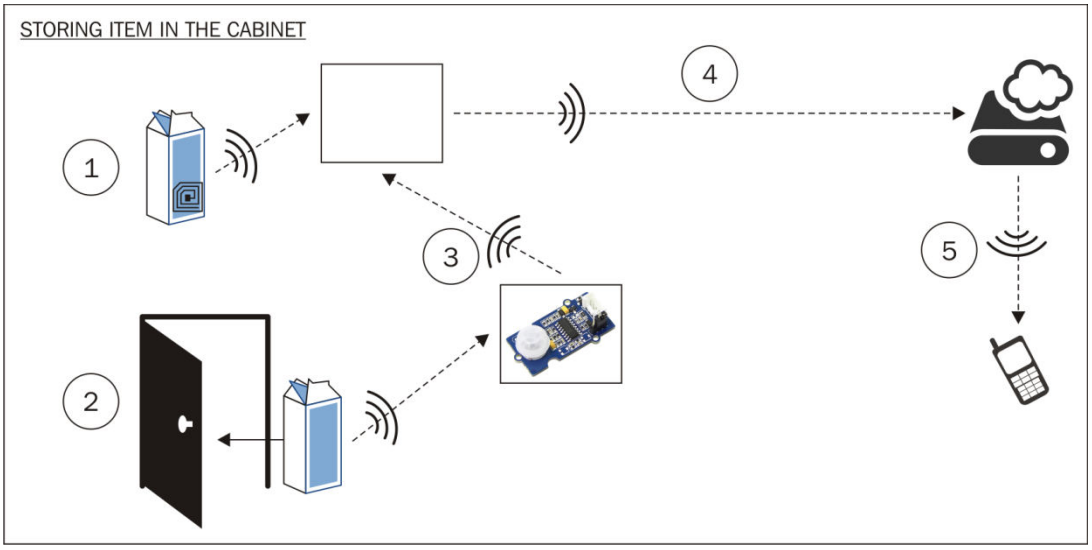
Chapter 4: Connecting the Sensors

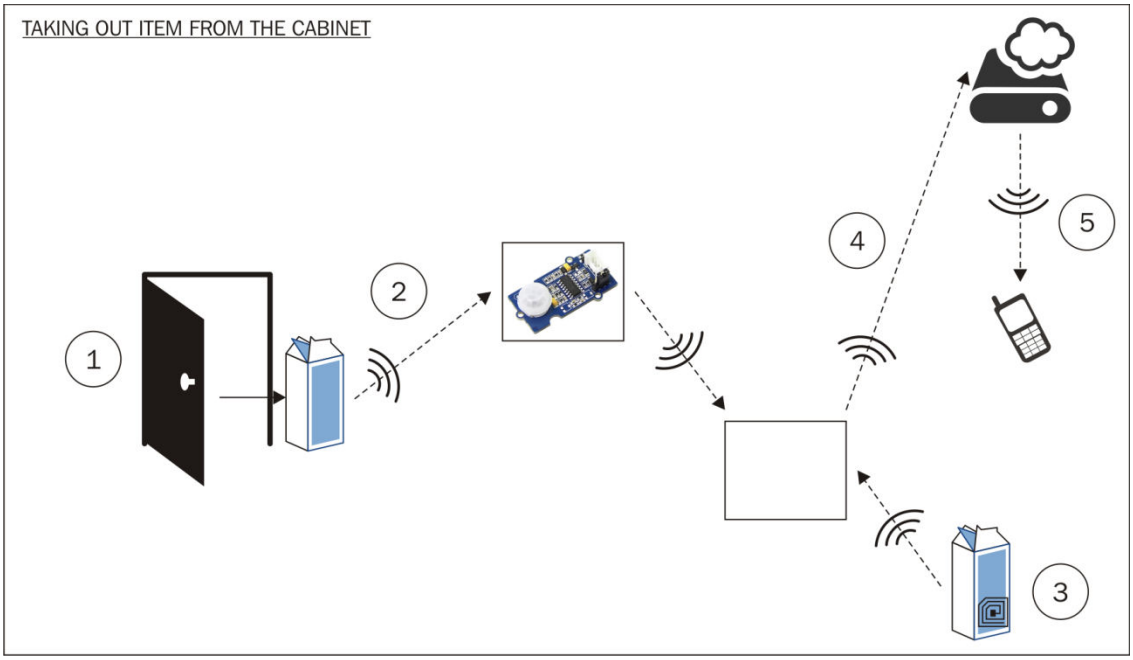


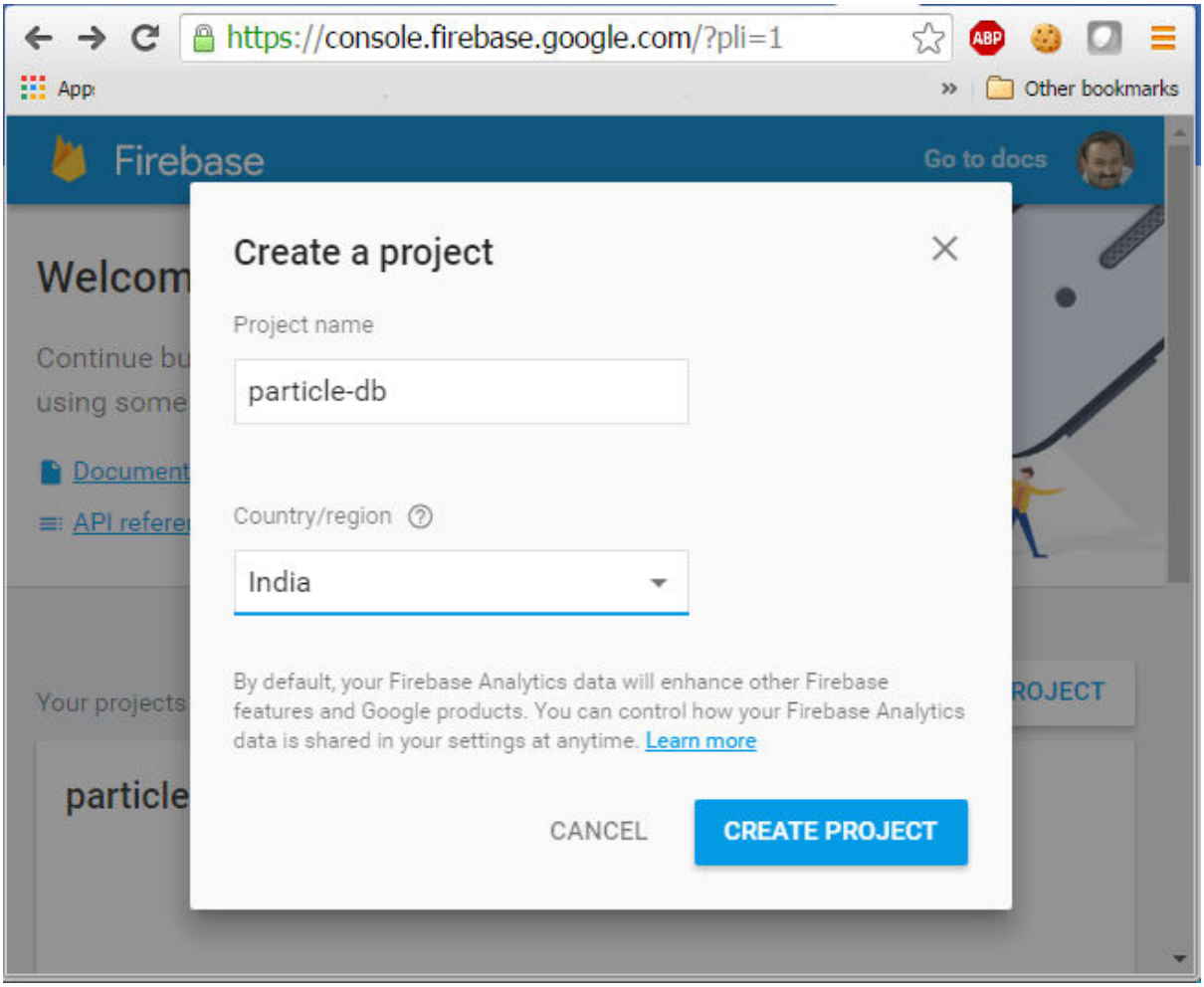


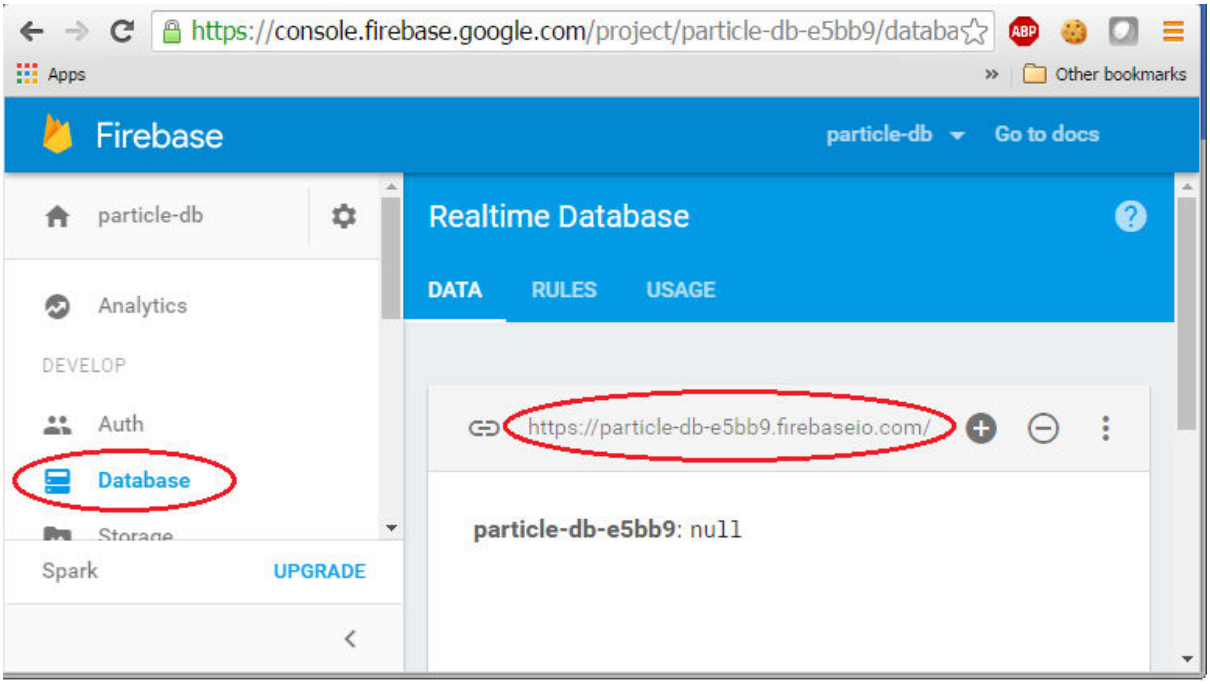
- MISO (Master In Slave Out) The Slave line for sending data to the master
- MOSI (Master Out Slave In) - The Master line for sending data to the peripherals
- SCK (Serial Clock) - The clock pulses which synchronize data transmission generated by the master
- SS (Slave Select) -When SS pin is low, only then it communicates with the master.

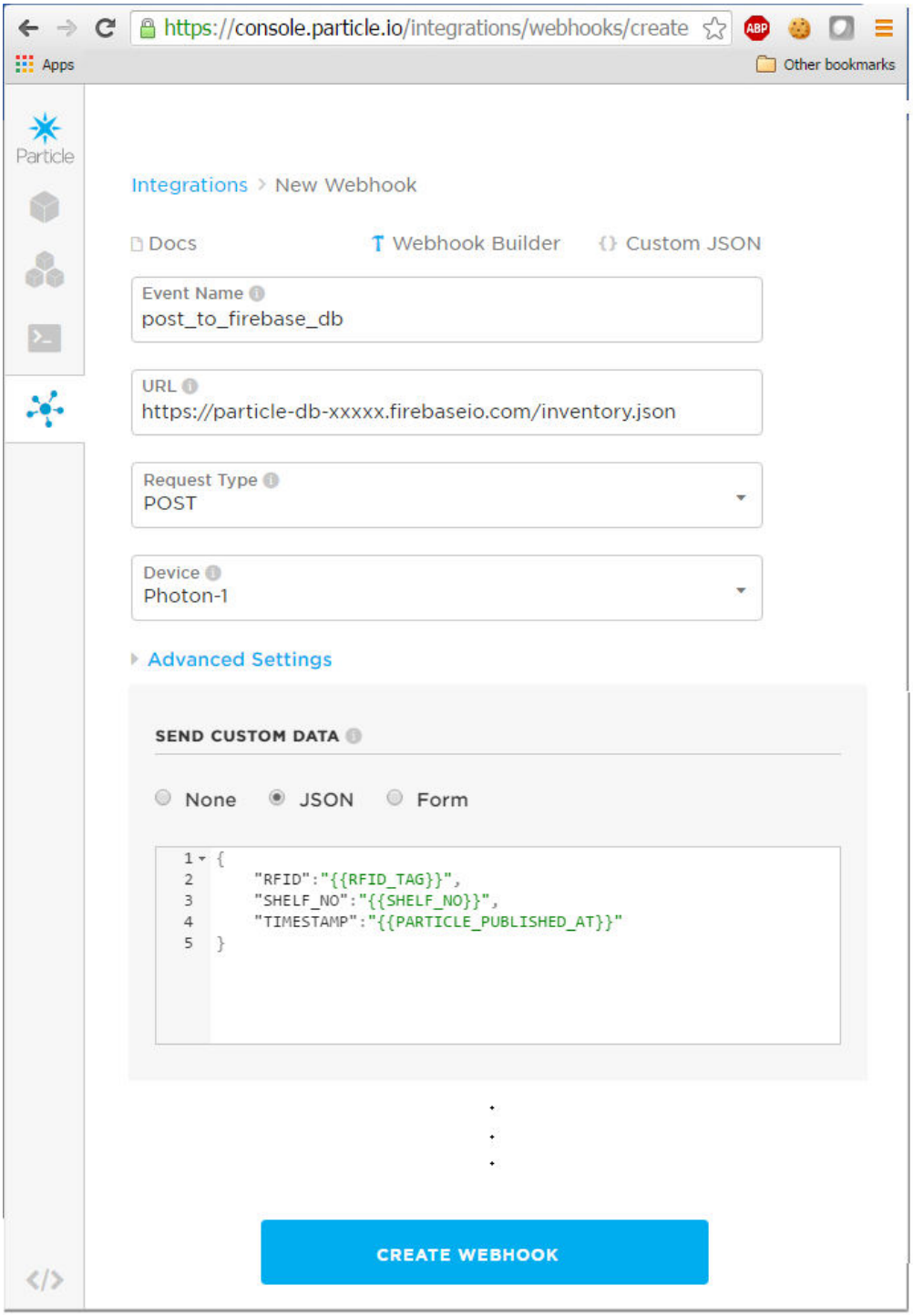

D0
D1
D2
D3
D4
D5
D6
D7
GND
VBAT
RST
3V3
A0
A1
A2
A3
A4
A5
DAC
WKP
RX
TX
GND
VIN
RESET
SETUP
Sensor
v1.2
TP3
TP4
D1
NC
VCC
GND
TP2
TP1
N_Retrig
Re_trig


STORING ITEM IN THE CABINET
1
2
3
4
5

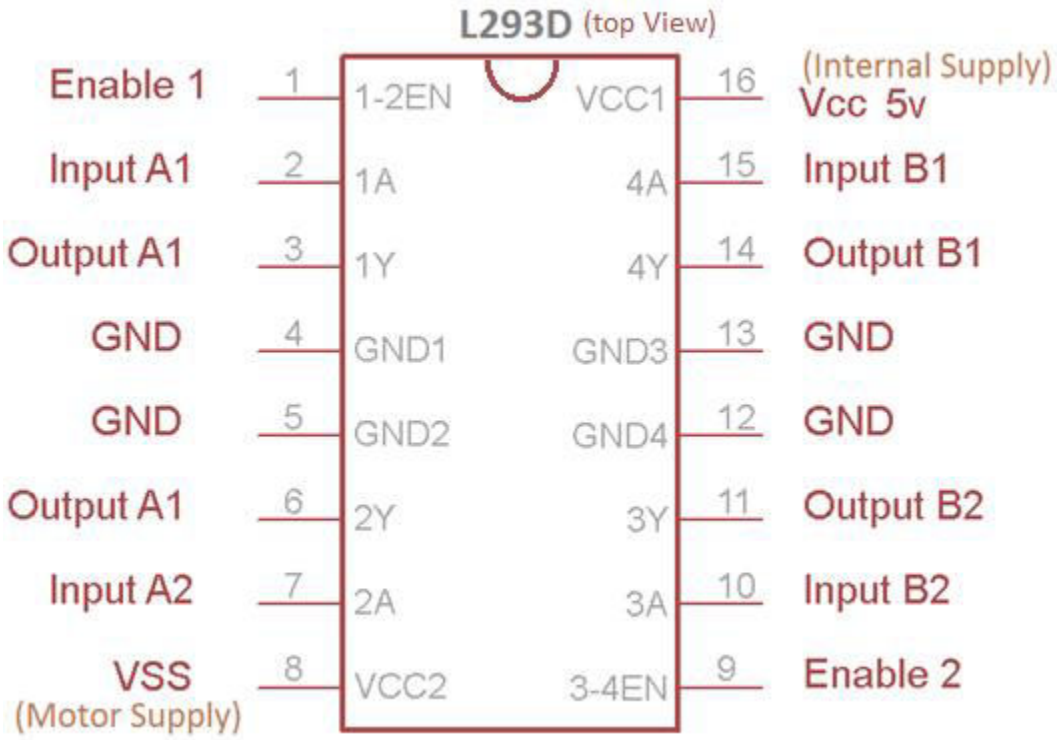

TAKING OUT ITEM FROM THE CABINET
1
2
3
4
5

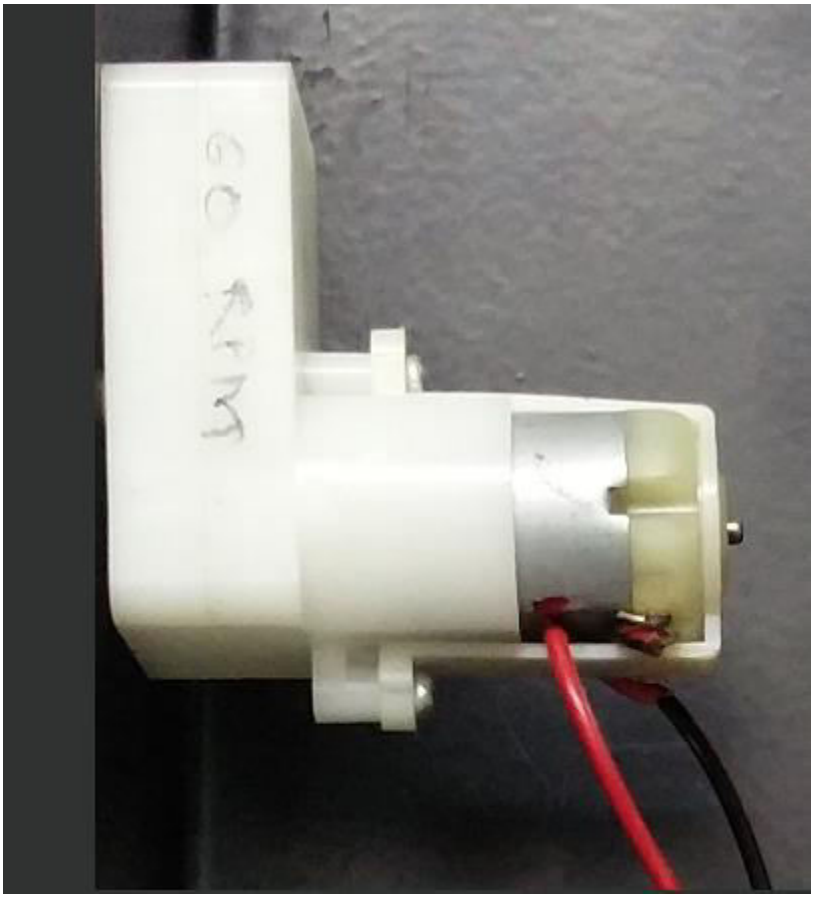

https://console.firebase.google.com/?pli=1
Apps
Other bookmarks
Firebase
Go to docs
Welcom
Continue bu
using some
Document
API refere
Your projects
particle
ROJECT
Create a project
Project name
particle-db
Country/region
India
By default, your Firebase Analytics data will enhance other Firebase features and Google products. You can control how your Firebase Analytics data is shared in your settings at anytime. Learn more
CANCEL
CREATE PROJECT

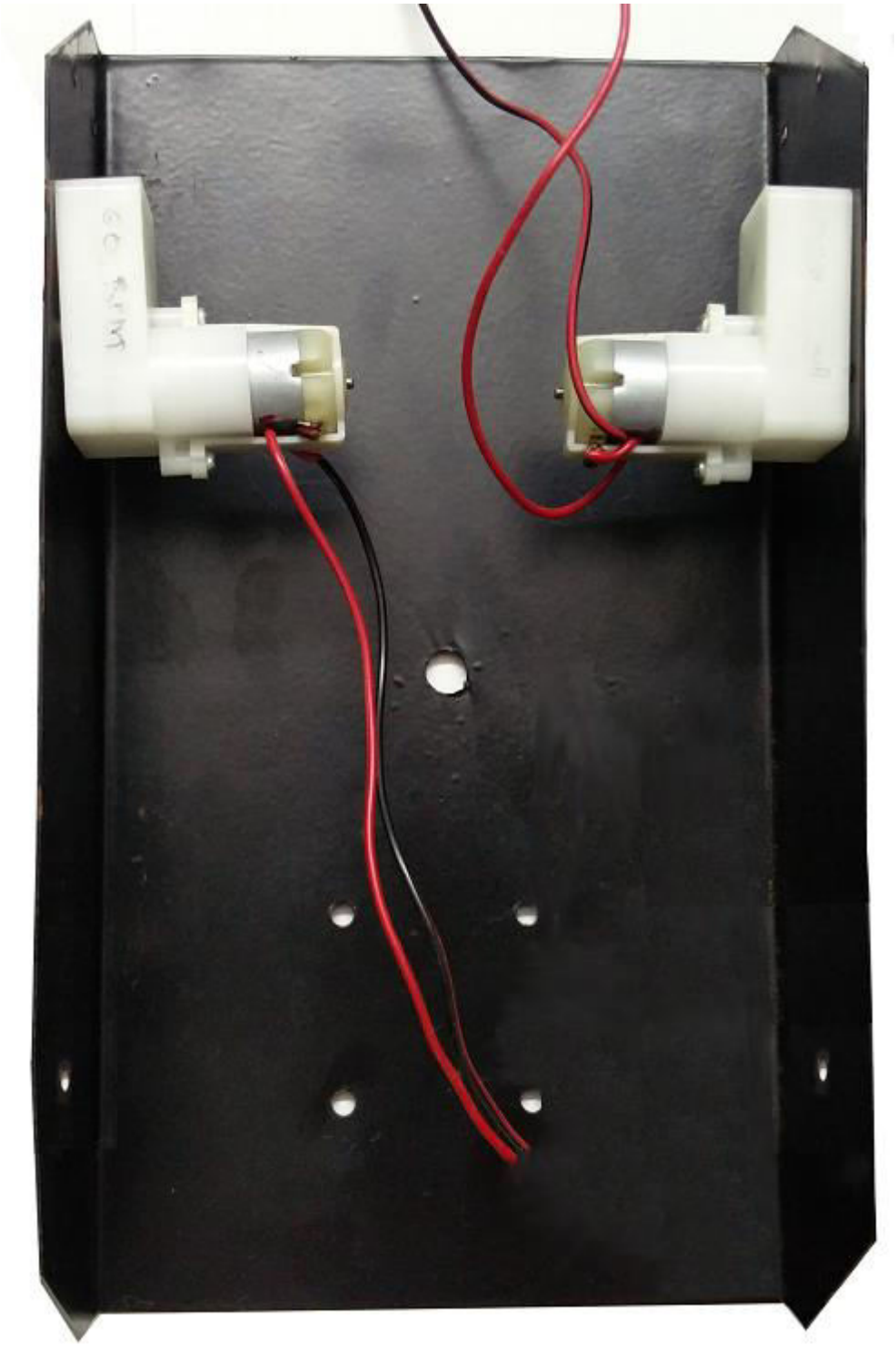

https://console.firebase.google.com/project/particle-db-e5bb9/databa
Apps
Other bookmarks
Firebase
particle-db
Go to docs
particle-db
Realtime Database
Analytics
DATA
RULES
USAGE
DEVELOP
https://particle-db-e5bb9.firebaseio.com/
Auth
Database
particle-db-e5bb9: null
Spark
UPGRADE

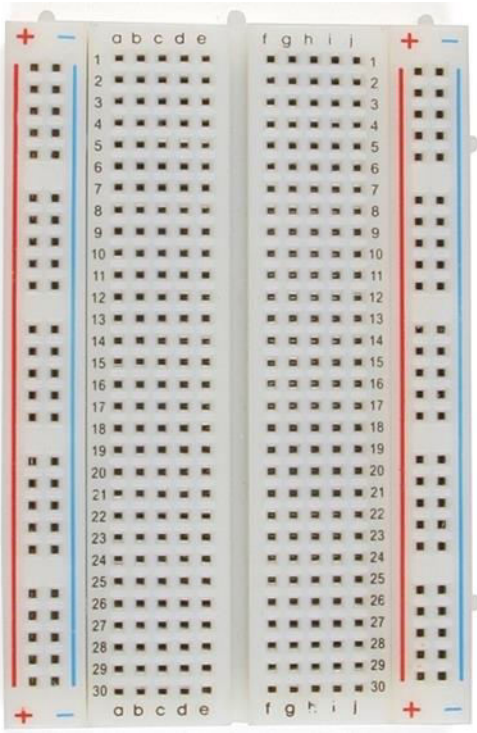

https://console.particle.io/integrations/webhooks/create
Apps
Other bookmarks
Particle
Integrations › New Webhook
Docs
Webhook Builder
Custom JSON
Event Name
post_to_firebase_db
URL
https://particle-db-xxxxx.firebaseio.com/inventory.json
Request Type
POST
Device
Photon-1
Advanced Settings
SEND CUSTOM DATA
None
JSON
Form
1 {
2 "RFID":"{{RFID_TAG}}",
3 "SHELF_NO":"{{SHELF_NO}}",
4 "TIMESTAMP":"{{PARTICLE_PUBLISHED_AT}}"
5 }
CREATE WEBHOOK

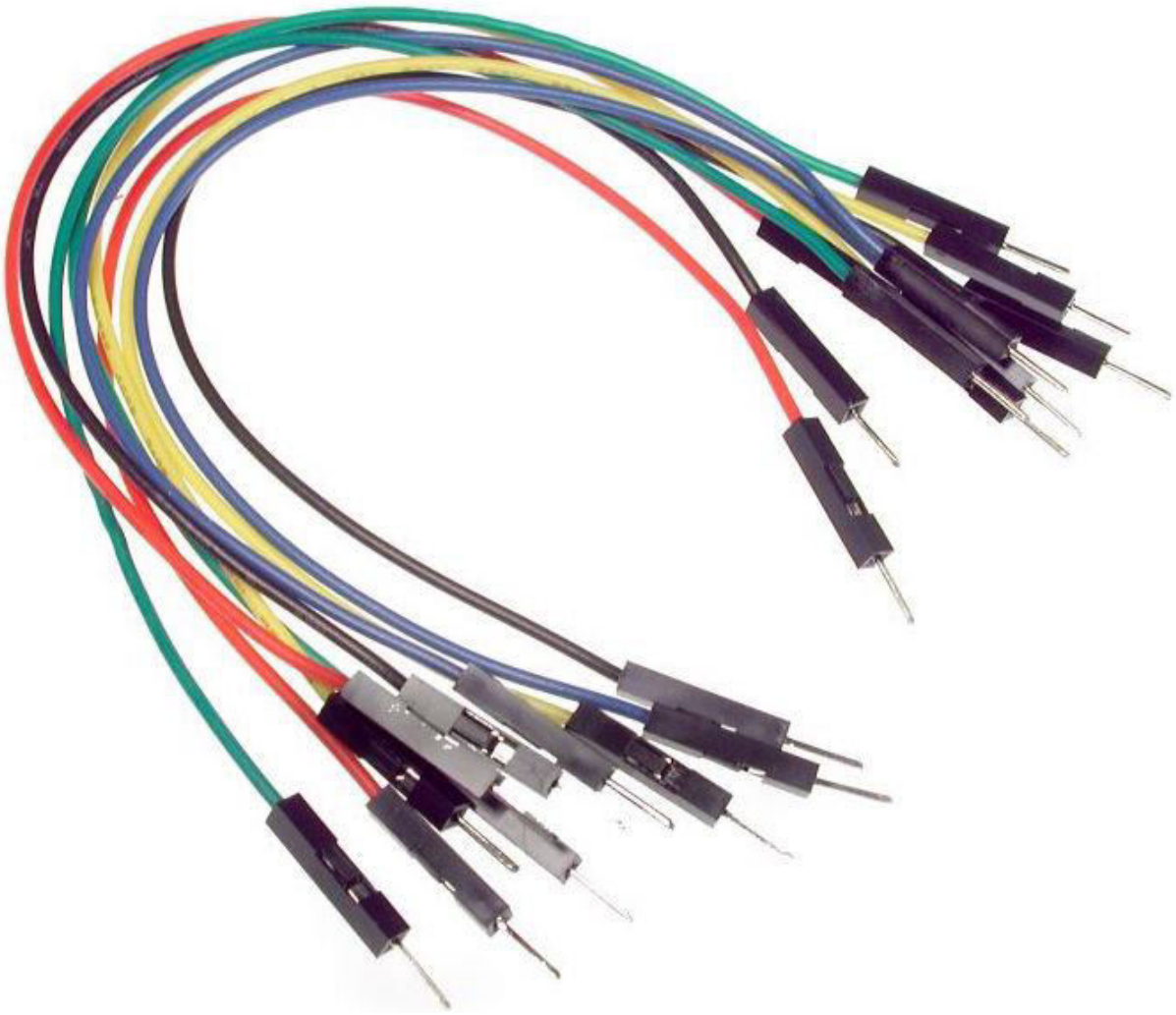
Chapter 5: Of Cars and Controllers

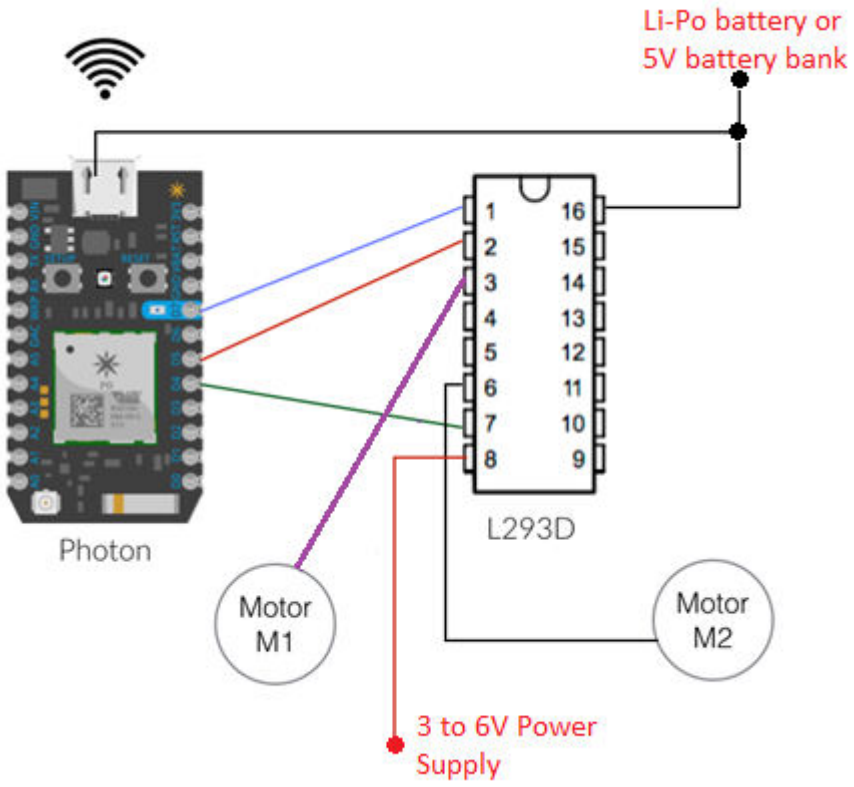

L293D (top View)
Enable 1
1
1-2EN
Input A1
2
1A
Output A1
3
1Y
GND
4
GND1
GND
5
GND2
Output A1
6
2Y
Input A2
7
2A
VSS
(Motor Supply)
8
VCC2
16
VCC1
(Internal Supply)
Vcc 5v
15
4A
Input B1
14
4Y
Output B1
13
GND3
GND
12
GND4
GND
11
3Y
Output B2
10
3A
Input B2
9
3-4EN
Enable 2

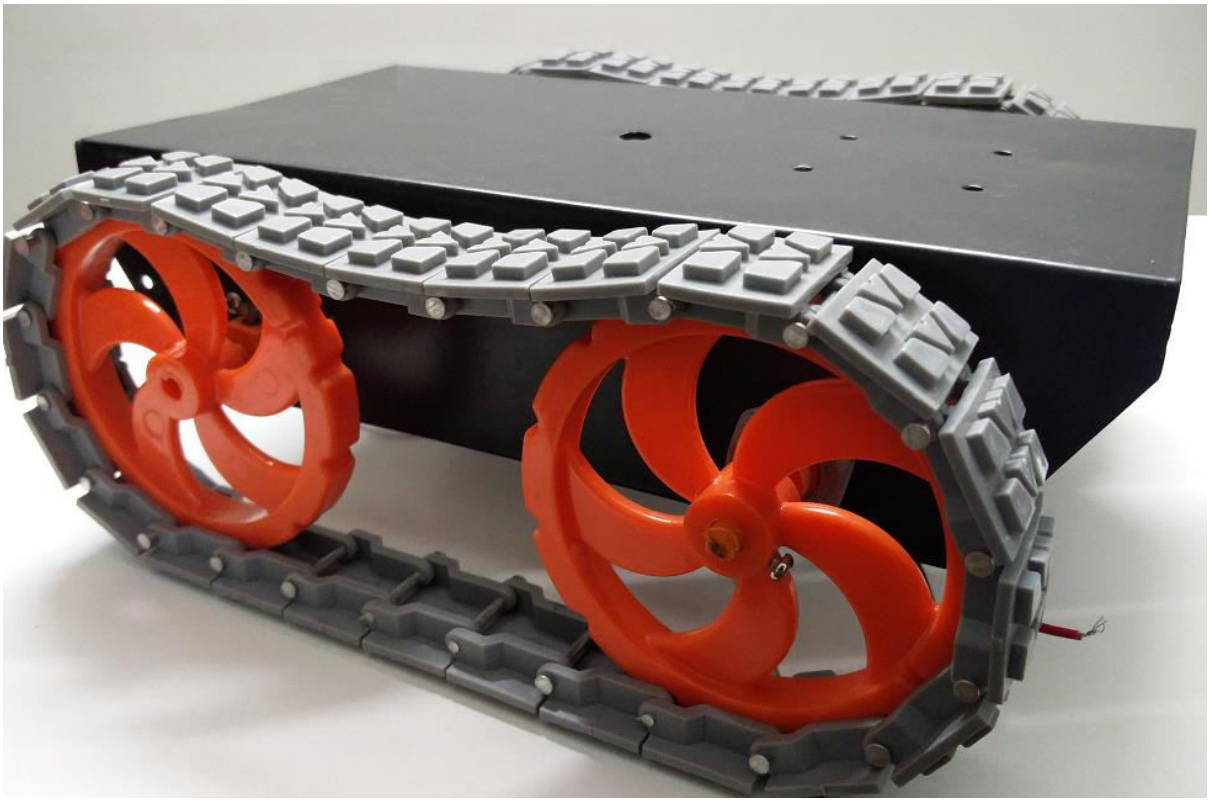


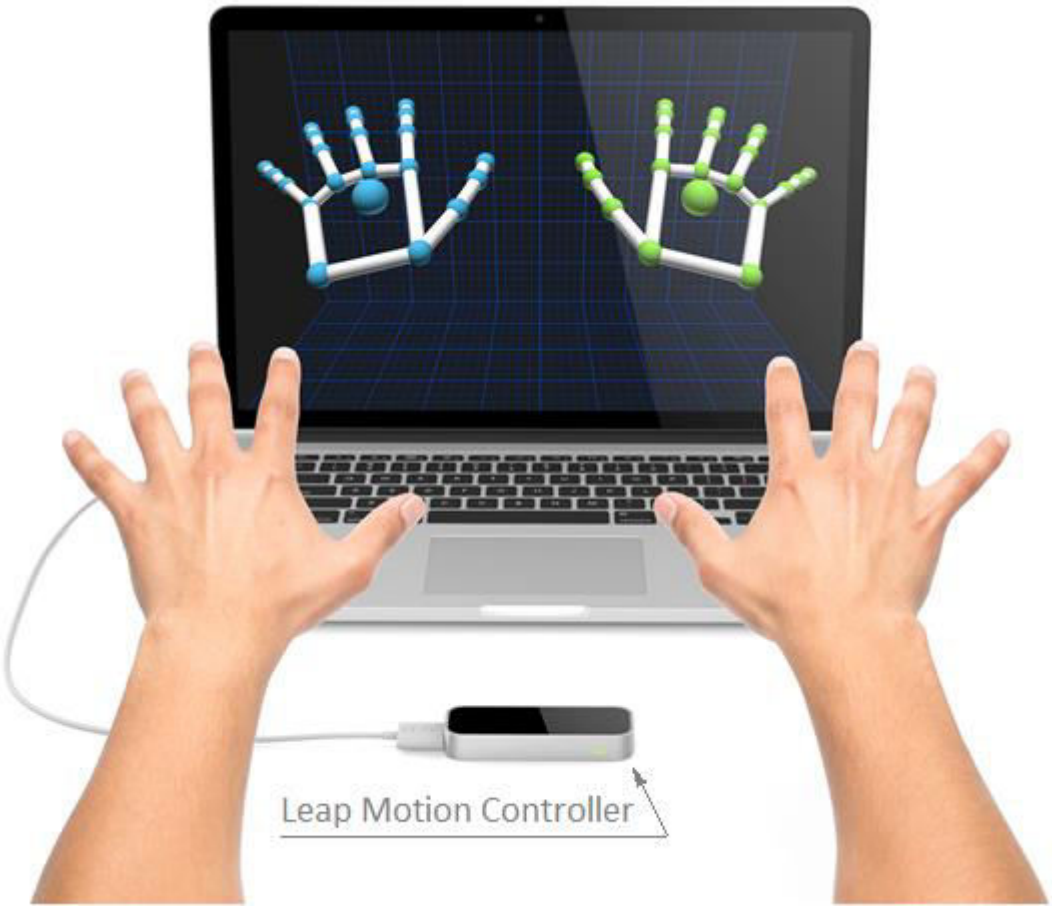


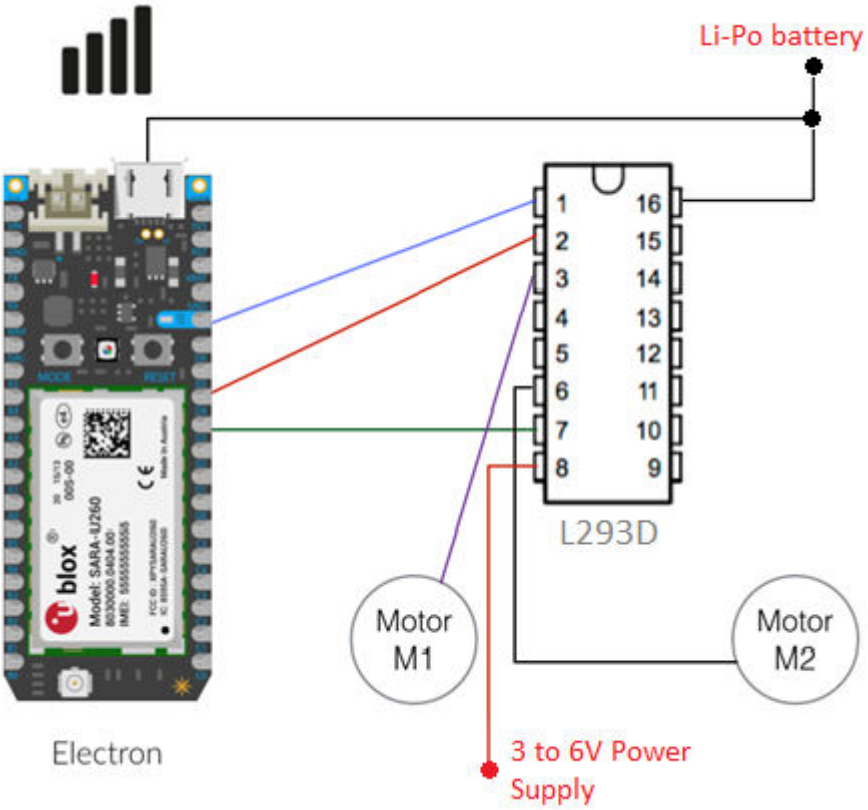

a b c d e
f g h i j
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30




Li-Po battery or
5V battery bank
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
L293D
Photon
Motor
M1
Motor
M2
3 to 6V Power
Supply




Leap Motion Controller


Li-Po battery
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
L293D
Motor
M1
Motor
M2
Electron
3 to 6V Power
Supply