Team Apple CDR Presentation

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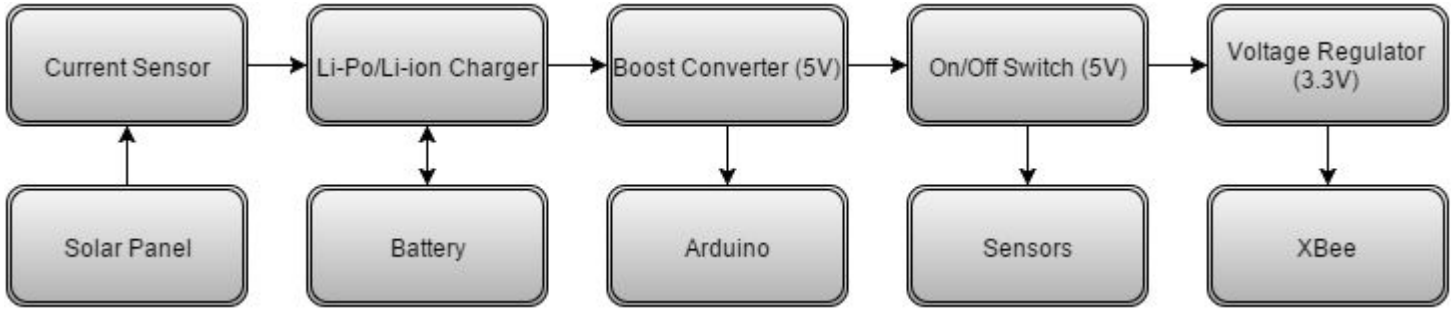
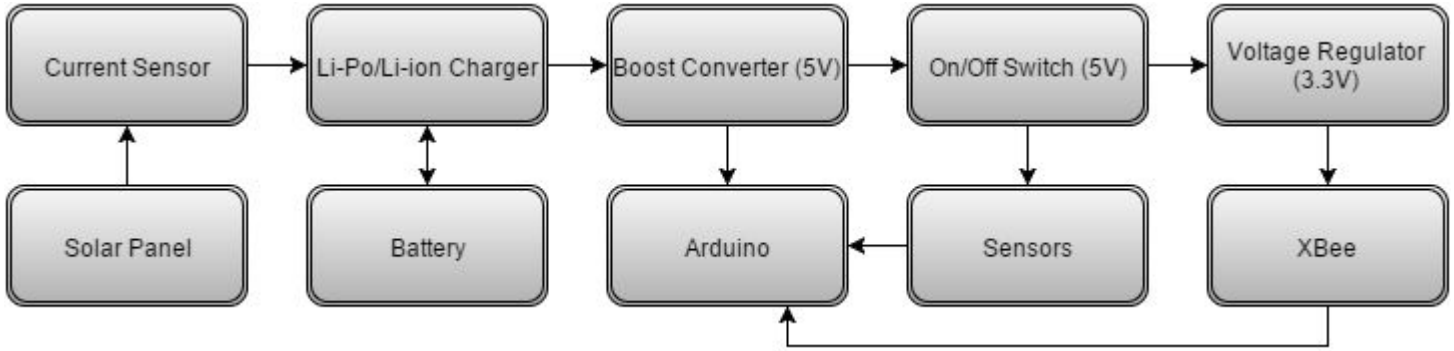
Overview of Presentation

1. Block Diagram
2. Schematic
3. Power Budget & Bill of Material
4. Progress Since PDR
5. Problems and Issues
6. Work to be Completed
7. Questions

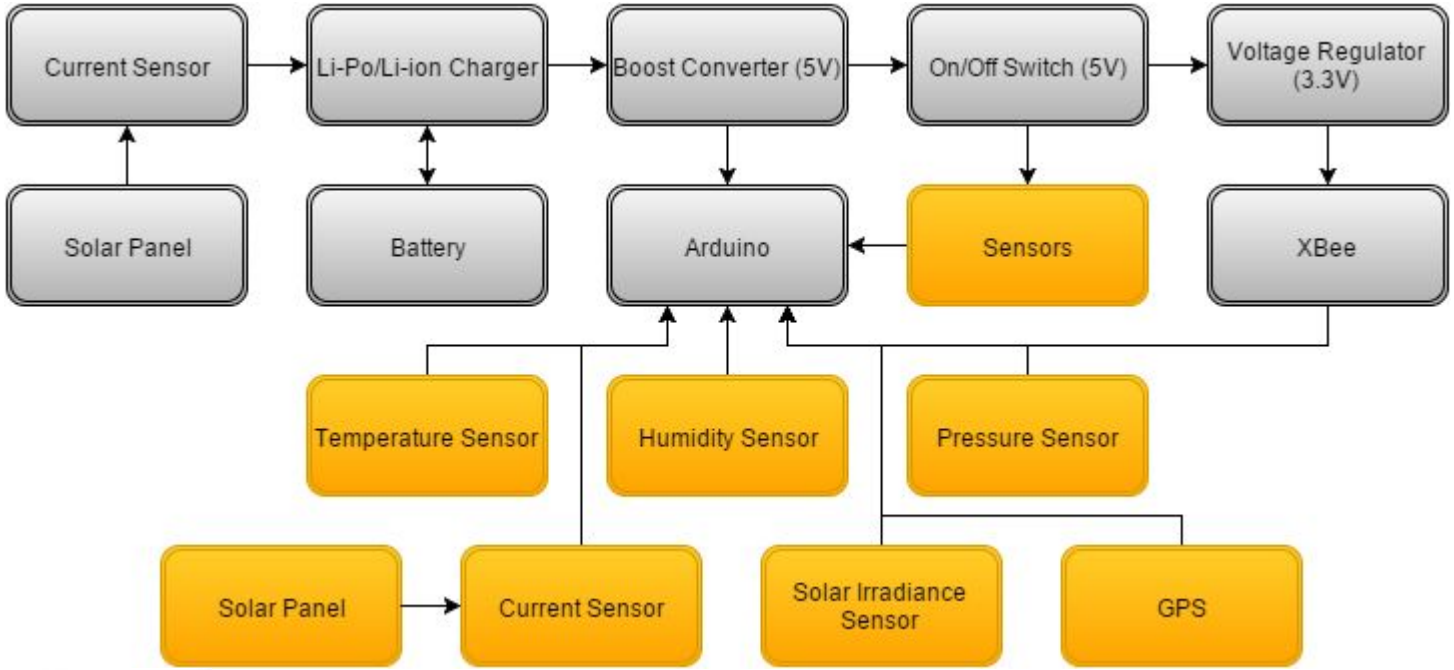
Block Diagram

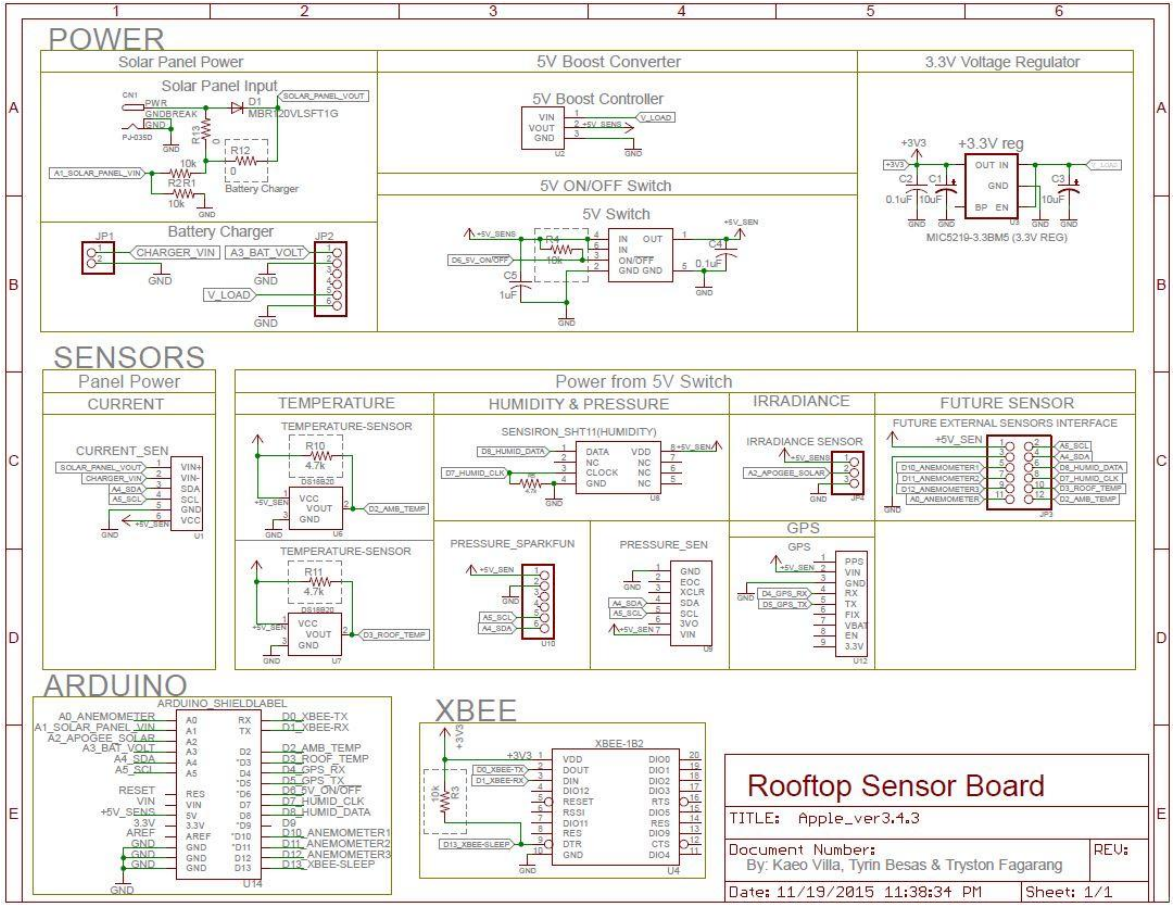


Block Diagram



Block Diagram



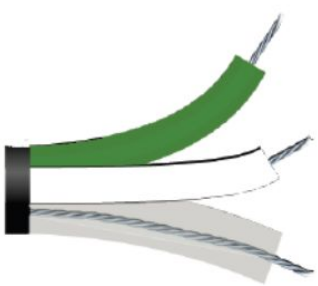

POWER
Solar Panel Power
Solar Panel Input
Battery Charger
5V Boost Converter
5V Boost Controller
5V ON/OFF Switch
5V Switch
3.3V Voltage Regulator
+3.3V reg
MIC5219-3.3BM5 (3.3V REG)
SENSORS
Panel Power
CURRENT
CURRENT_SEN
Power from 5V Switch
TEMPERATURE
TEMPERATURE-SENSOR
HUMIDITY & PRESSURE
SENSIRON_SHT11(HUMIDITY)
PRESSURE_SPARKFUN
PRESSURE_SEN
IRRADIANCE
IRRADIANCE SENSOR
GPS
FUTURE SENSOR
FUTURE EXTERNAL SENSORS INTERFACE
ARDUINO
ARDUINO_SHIELDLABEL
XBEE
XBEE-1B2
Rooftop Sensor Board
TITLE: Apple_ver3.4.3
Document Number:
By: Kaeo Villa, Tyrin Besas & Tryston Fagarang
REV:
Date: 11/19/2015 11:38:34 PM
Sheet: 1/1

Schematic

Major Schematic Changes

Changed Irradiance Sensor - Apogee SP-215

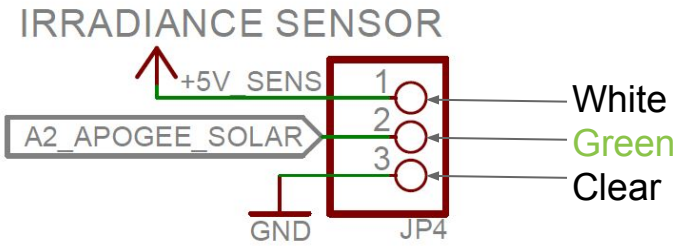
- No op-amp needed
- Not self powered



Green Positive (signal from sensor)

White Input power

Clear Ground (for sensor signal and input power)



Major Parts

Part Name	Min Voltage (V)	Supply Voltage (V)	Idle Current (mA)	Typical Current (mA)	Max Current Draw (mA)	Max Power Dissipated (W)
Arduino Uno R3	5	5	0.0001	-	50	0.25
DC Current Sensor	3	5	0.006	0.7	1	0.005
GPS Sensor	3	5	4	12	20	0.1
Humidity/Temperature Sensor (Ambient)	2.4	5	0.0003	0.028	1	0.005
Pressure Sensor	1.8	5	0.001	0.65	1	0.005
Temperature Sensor (Roof)	3	5	0.75	1	1.5	0.0075
Solar Irradiance Sensor	5	5	-	-	0.3	0.0015
Digi International XBee Pro S2B	2.7	3.3	15	0.0035	220	0.726

Battery Supply

Part Name	Supply Voltage (V)	Max Supply Current (A)
Battery	3.7	6.6

Regulated Power Supply

Part Name	Supply Voltage (V)	Max Supply Current (A)
5V Boost Converter	5	200
3.3V Regulator	3.3	500

Power Budget

Max Power Consumption (mW)

3.3 V Lines	5 V Lines	Total (3.3+5)V Lines
726	374	1100

Max Current Draw (mA)

3.3 V Lines	5 V Lines
220	74.8

	Part Name	Vendor	Product ID/#	Unit Cost	Quantity
1	USB LiPoly/Li-Ion Charger (3.7/4.2V) MCP73871	Adafruit	390	**$17.50**	1
2	Arduino Uno R3	Adafruit	50	**$24.95**	1
3	Ultimate GPS Breakout v3	Adafruit	746	**$39.95**	1
4	Digi International XBee Pro S2B	Adafruit	967	**$37.95**	1
5	Tenergy Li-Ion 18650 3.7V 6600mAh	Adafruit	353	**$29.50**	1
6	Barometric Pressure Sensor BMP180 (newer model)	Adafruit	1603	**$9.95**	1
7	INA219 High SIde DC Current Sensor Breakout 26V ± 3.2A Max	Adafruit	904	**$9.95**	1
8	Interface Cable - RPSMA Female to RPSMA Male (25cm)	Sparkfun	12860	**$4.95**	1
9	Silicon-Cell Pyranometer SP-215	Apogee	SP-215	**$235.00**	1
10	Large 6V 3.4W Solar Panel 3.4 Watt	Adafruit	500	**$39.00**	2
11	AL-100 Solar Sensor Leveling Plate	Apogee	Al-100	**$35.00**	1
12	One Wire Digital Temperature Sensor - DS18B20	Sparkfun	245	**$4.25**	1
13	2.4GHz Duck Antenna RP-SMA - Large	Sparkfun	558	**$9.95**	1
14	Sensirion Temperature/Humidity Sensor - SHT11	Adafruit	246	**$35.00**	1
	Unit Sub Cost (Major Parts)				
	$571.90				

Bill of Materials

Progress Since PDR

Housing - Decided on a housing choice (Outdoor Junction Box)

Schematic - Updated the previous design

Documentation - Parsed the previous documentation of Apple

Some Problems and Issues

Housing - Indoor VS outdoor junction boxes

Schematic - Correctly wired schematic and & designing the board layout

Documentation - Locating information within previous design

Work to be Completed

Board - Layout and Fabrication

Housing - Acquire and Assemble

Documentation - Complete and Organize

Post Assembly - Test and Deployment

Any Questions?