Hot Car Emergency Solutions

A prototype conceptualized by:

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Subsystems

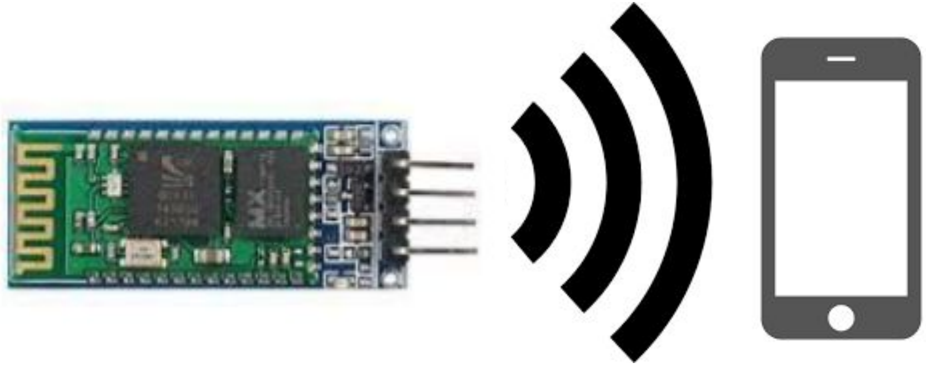
1. App connectivity
2. Carbon monoxide
3. Heat detection
4. Child monitoring
5. Power
    a. Arduino
    b. Sensors

Subsystem 1: App connectivity

Bluetooth module HC-05 (app):

Module that adds bluetooth connectivity to arduino uno.

- A program will send data (temperature, CO levels etc.,) to the cell phone in range
- The phone receiving that data will respond accordingly pushing a notification to the user.

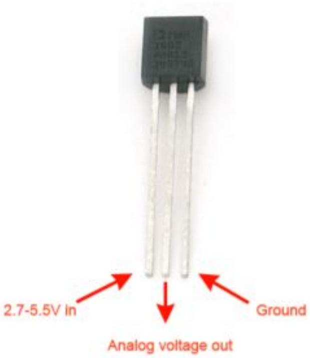


Subsystem 3: Heat detection

TMP 36:

The heat detecting sensor will record the temperature. The TMP 36 consists of a chip and 3 pins of 0.92mm in length

- Power Range: 2.7V to 5.5V
- Temperature Range: -40°C to 150°C
- Degree of Precision: ± 0.1 °C
- Price: 3.45$



Subsystem 2:Carbon Monoxide detection

MQ 7

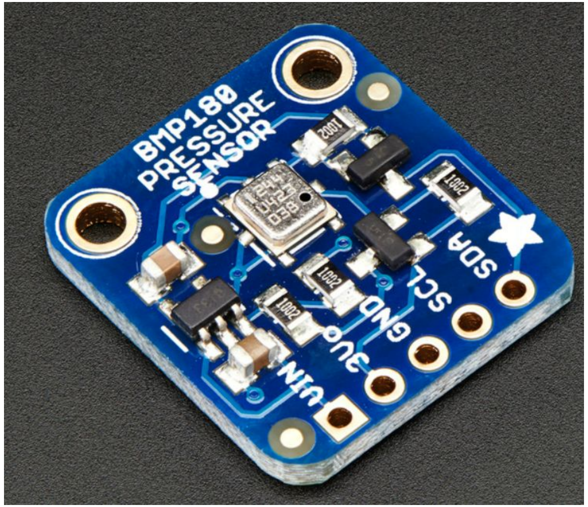
Works when the sensor detects a dangerous level of carbon monoxide

- Compatible with Arduino Uno
- Power Range: 2.5V to 5V
- Dimensions: 40 mm x 21mm

Subsystem 3: Heat detection (revise)

BMP-180:

- Power Range: 3.3V to 5V
- Temperature Range: -40°C to 85°C
- Degree of Precision: ± 2 °C
- Price: 10$/sensor

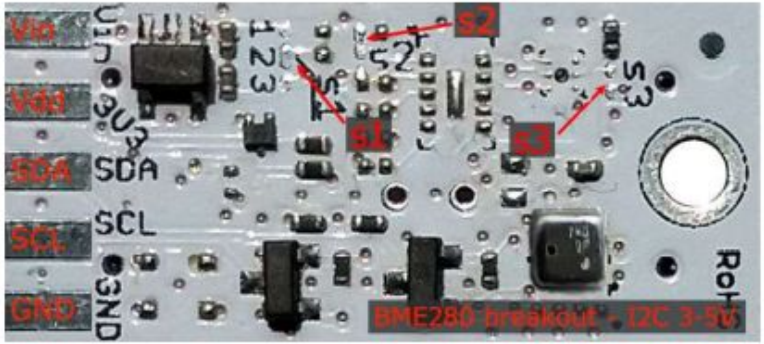


Subsystem 3: Heat detection (revise)

BME-280:

The heat detecting sensor will record the temperature. The BME-280 is 13x27mm dimension wise.

- Power Range: 3.3V to 5V
- Temperature Range: -40°C to 85°C
- Degree of Precision: ± 1 °C
- Price: 24$/sensor

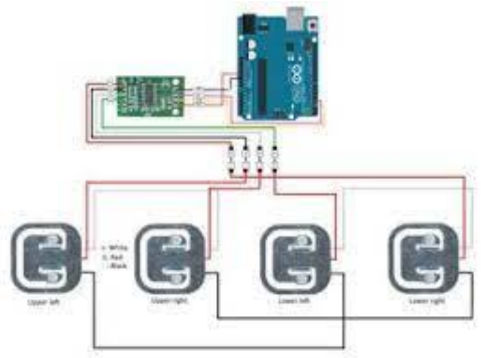


Subsystem 4: Child Monitoring

Weight pad

The motion sensor would detect if the specific weight limit is exceeded which would indicate if there is a child or a pet in the car.

- Price: 14.02$
- Installation: professional
- Sends data to the phone
- Intrusive and may add discomfort



Subsystem 4: Child Monitoring

Seat clip

The motion sensor would detect if the specific weight limit is exceeded which would indicate if there is a child or a pet in the car.

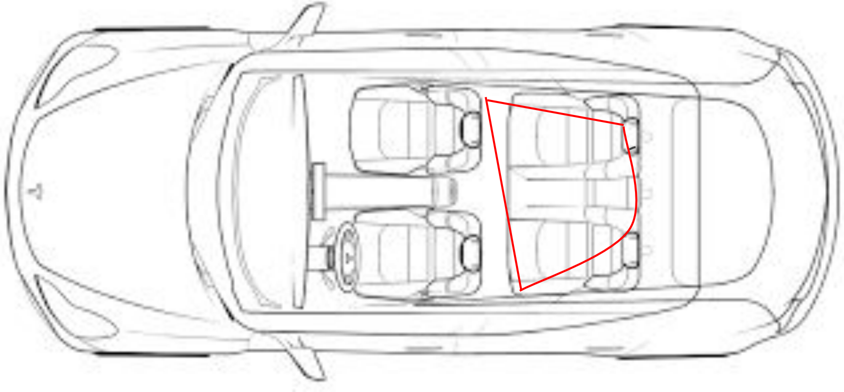
- Price: 0.35$
- Installation: DIY
- Sends data to the phone
- May be bulky and dangerous

Subsystem 4: Child Monitoring

Motion sensor(HC-SR501)

The motion sensor would detect if there is movement in the car which would indicate if there is a child in the car.

- Price: 2.80$
- Installation: DIY
- Sends data to the phone



Subsystem 5: Arduino Power Source

Power Bank:

This power supply should provide enough electricity to uniquely keep the Arduino Uno running

- Arduino Uno required power range: 6V to 20V
- Arduino Uno Optimal power range: 7V to 12V
- Price: 40$
- rechargeable battery

Subsystem 6:Secondary power supply

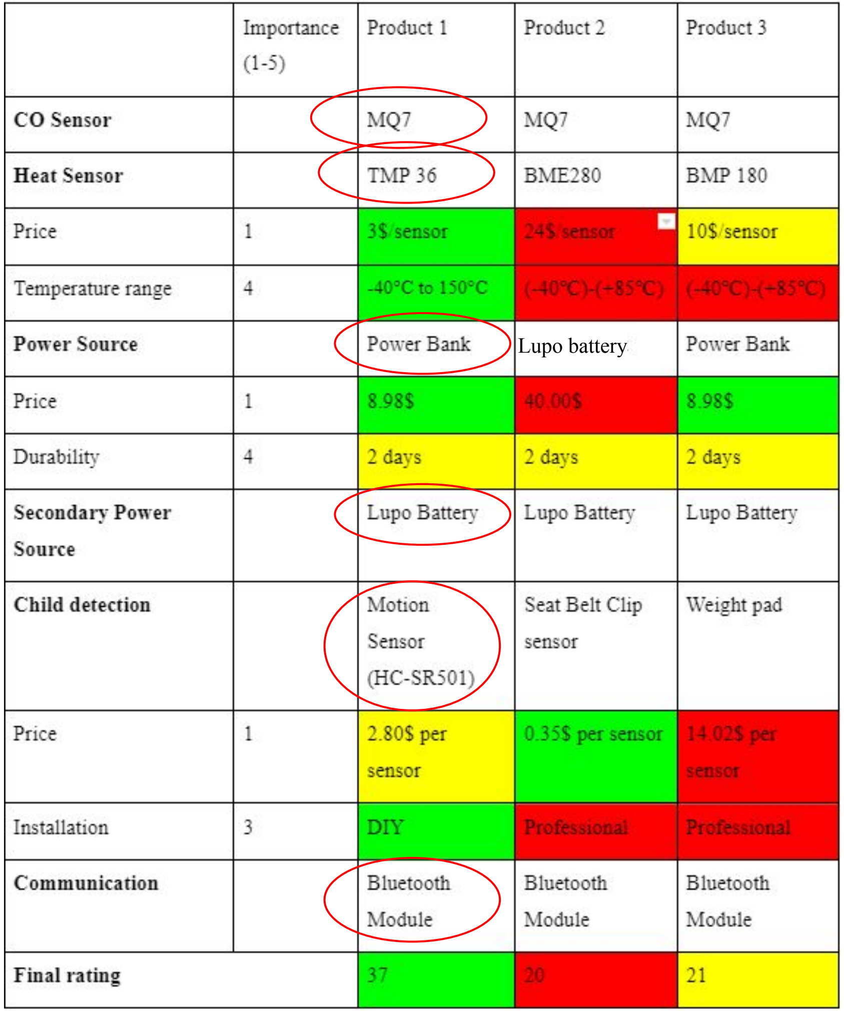
Lupo Battery

This power supply will provide enough electricity for all the sensors.

- Rechargeable.
- Portable, fitting with other components.
- Offers the proper voltage ranges for components.
- Large Capacity.
- Price: 32 to 43 $

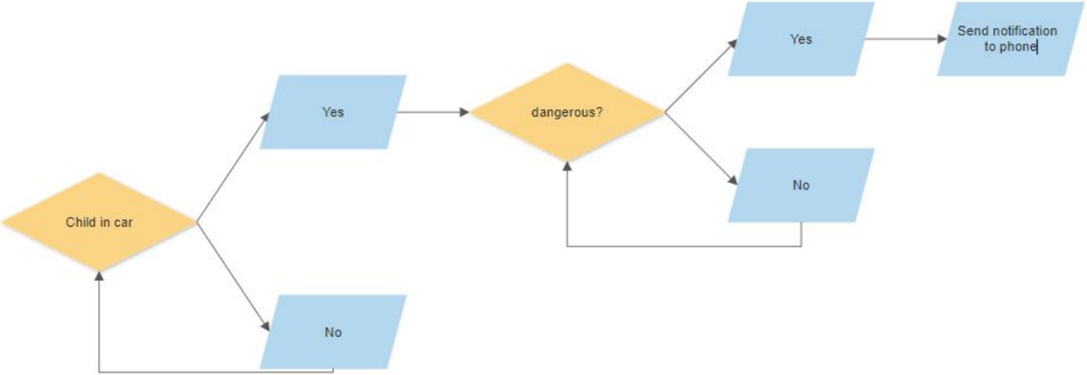
Benchmarking

- Price
- Installation
- Temperature
- Longevity



	Importance (1-5)	Product 1	Product 2	Product 3
CO Sensor		MQ7	MQ7	MQ7
Heat Sensor		TMP 36	BME280	BMP 180
Price	1	3$/sensor	24$/sensor	10$/sensor
Temperature range	4	-40°C to 150°C	(-40°C)-(+85°C)	(-40°C)-(+85°C)
Power Source		Power Bank	Lupo battery	Power Bank
Price	1	8.98$	40.00$	8.98$
Durability	4	2 days	2 days	2 days
Secondary Power Source		Lupo Battery	Lupo Battery	Lupo Battery
Child detection		Motion Sensor (HC-SR501)	Seat Belt Clip sensor	Weight pad
Price	1	2.80$ per sensor	0.35$ per sensor	14.02$ per sensor
Installation	3	DIY	Professional	Professional
Communication		Bluetooth Module	Bluetooth Module	Bluetooth Module
Final rating		37	20	21

App structure


Child in car
Yes
No
dangerous?
Yes
No
Send notification to phone