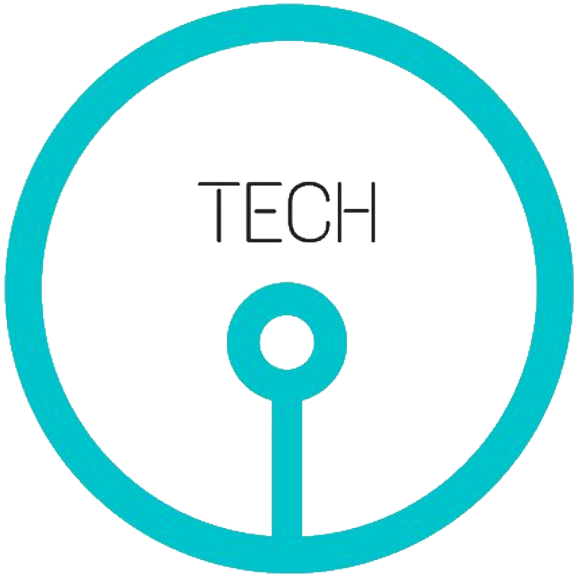
IoTECH*

*Internet of Things Extensible Car Hub

FPR Presentation



The IoTECH Team

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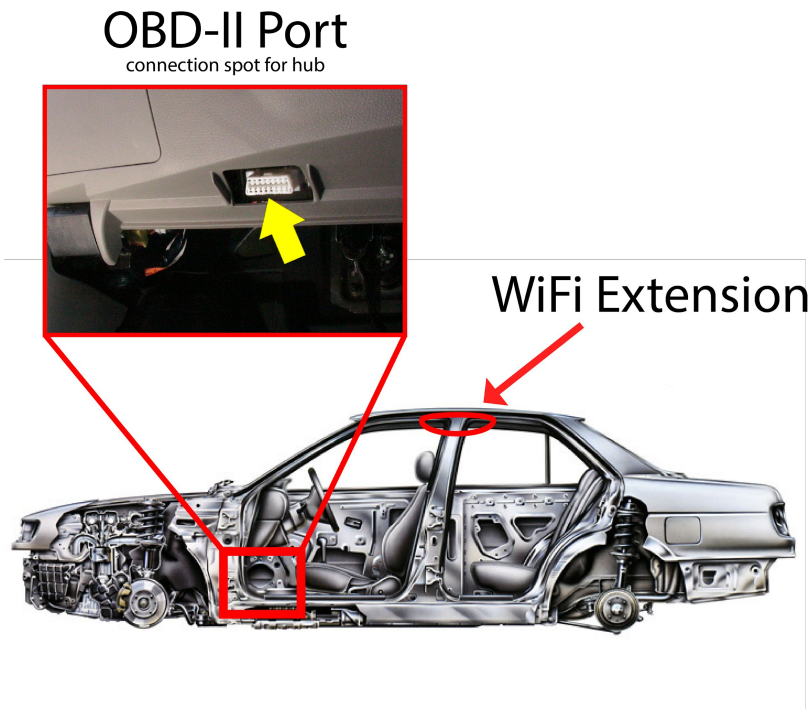
IoTECH -Introduction



Iotech:
Most current IoT devices don't extend beyond the home with WiFi applications. Very few automotive IoT devices on the market!

- "Smart Hub" - IoT Device
- Interface with OBD-II Port & External Sensors
- 3G/WiFi/Bluetooth data transfer
- Many potential applications

IOTECH:The Swiss Army Knife of IoT Car Applications

- User will be able to use various applications in the vehicle from getting a warning that they left their child in a hot car, to checking if their teenage child is speeding.
- **Competition:**
  - T-mobile SyncUp: Uses App to give information about Car, Location, and Wifi Hotspot.
  - Progressive Snapshot: Monitors Driving Habits of Drivers
  - AUT-350C Pro: Tracking, Check Engine Light Verifier, Connect to IFTTT, 3G Subscription, Crash Alert Service

How is our Device Better?

- It can be programmed by IoTECH to do any application with the hardware on the extension or Hub by request from customers,
- Competitors keep all sensors under the dash while our product extends and adds sensors not found on our competitors devices or the Can-Bus

Final Product!!!

- ✓ 2 Fully Working Applications in Unison
- ✓ Enclosure for Both Extension and Hub
- ✓ Two PCBs (Hub and Extension)

Extra: Added an extra fully working Application (Gas)

Requirements: Specifications

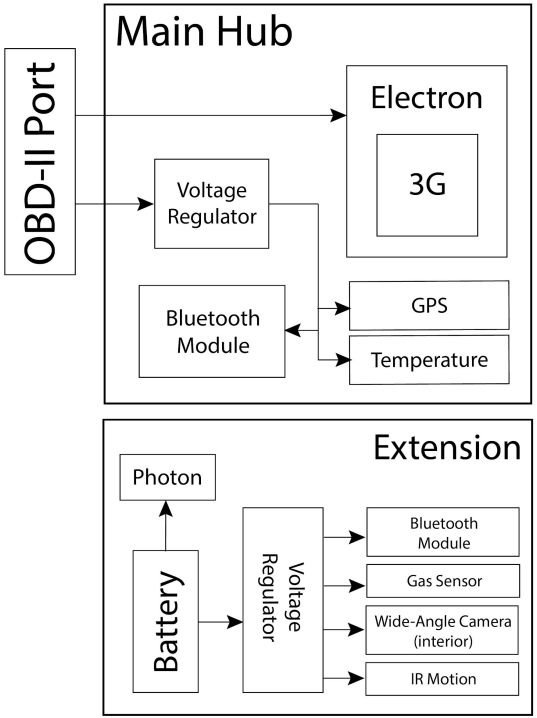
- **Small and lightweight**
  - Hub: (~100g) (2.5 x 2.5 x 2 in) actual: [388g] [6.25 x 3.75x2]
  - Extension: (~200 g) (5 x 2.5 x 3 in) actual: [260 g] [5 x 1.75 x3.25]
- **Extensible**
  - Ability to expand IoTECH smart hub through hard-wired or wireless connections [Yes]
- **Modular**
  - Able to interface with multiple sensors [Yes]

Requirements: Specifications (cont'd)

- **Fast & Reliable**
  - Relay information immediately (i.e. alerts) [Yes]
  - Make sure alerts are seen by the user [Alerts Are Sent]
- **Efficient**
  - Car battery life 160-200 hrs (~1 week) [8 days]
  - Extension battery life 12+ hrs (average) [14 Hrs]
- **Secure**
  - Ensure that communication between devices are encrypted [Yes]

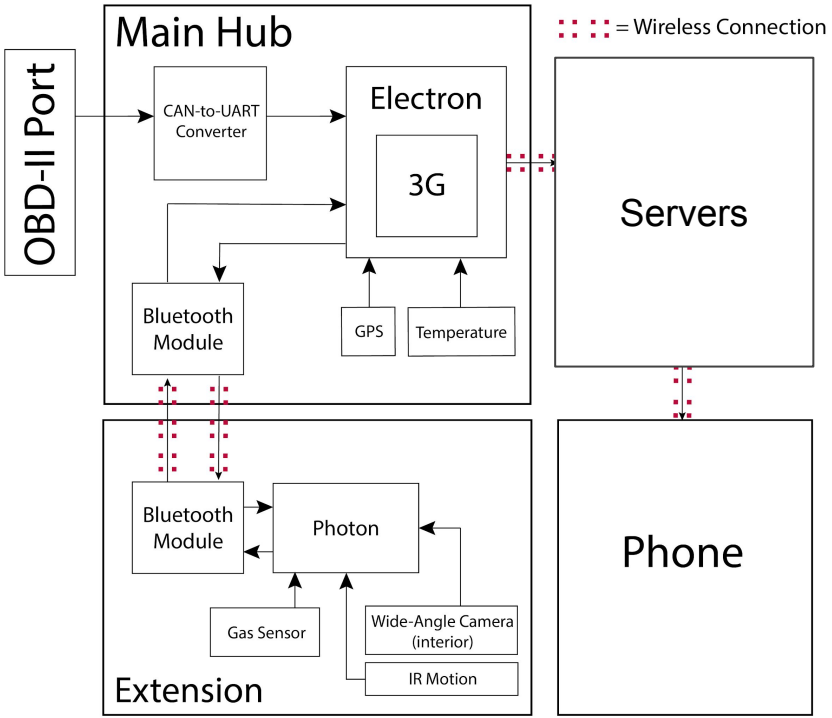
Block Diagrams - Power

FPR:



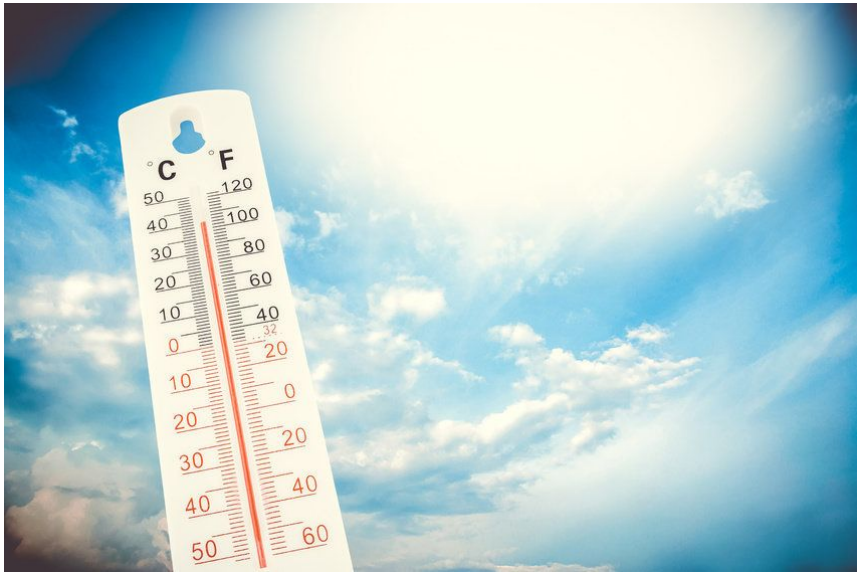
Block Diagrams - Signals

FPR:



IoT Application: TempAlert

Objective: To alert a parent that they left their child in a hot car, that can cause death.



What does it do?

- Sense temperature and motion
- If threshold reached and motion detected, send alert via 3G to server that then sends text to user.

IoT Application: TempAlert

NOAA national weather service: heat index

Relative humidity (%)	Temperature															
	80 °F (27 °C)	82 °F (28 °C)	84 °F (29 °C)	86 °F (30 °C)	88 °F (31 °C)	90 °F (32 °C)	92 °F (33 °C)	94 °F (34 °C)	96 °F (36 °C)	98 °F (37 °C)	100 °F (38 °C)	102 °F (39 °C)	104 °F (40 °C)	106 °F (41 °C)	108 °F (42 °C)	110 °F (43 °C)
40	80 °F (27 °C)	81 °F (27 °C)	83 °F (28 °C)	85 °F (29 °C)	88 °F (31 °C)	91 °F (33 °C)	94 °F (34 °C)	97 °F (36 °C)	101 °F (38 °C)	105 °F (41 °C)	109 °F (43 °C)	114 °F (46 °C)	119 °F (48 °C)	124 °F (51 °C)	130 °F (54 °C)	136 °F (58 °C)
45	80 °F (27 °C)	82 °F (28 °C)	84 °F (29 °C)	87 °F (31 °C)	89 °F (32 °C)	93 °F (34 °C)	96 °F (36 °C)	100 °F (38 °C)	104 °F (40 °C)	109 °F (43 °C)	114 °F (46 °C)	119 °F (48 °C)	124 °F (51 °C)	130 °F (54 °C)	137 °F (58 °C)	
50	81 °F (27 °C)	83 °F (28 °C)	85 °F (29 °C)	88 °F (31 °C)	91 °F (33 °C)	95 °F (35 °C)	99 °F (37 °C)	103 °F (39 °C)	108 °F (42 °C)	113 °F (45 °C)	118 °F (48 °C)	124 °F (51 °C)	131 °F (55 °C)	137 °F (58 °C)		
55	81 °F (27 °C)	84 °F (29 °C)	86 °F (30 °C)	89 °F (32 °C)	93 °F (34 °C)	97 °F (36 °C)	101 °F (38 °C)	106 °F (41 °C)	112 °F (44 °C)	117 °F (47 °C)	124 °F (51 °C)	130 °F (54 °C)	137 °F (58 °C)			
60	82 °F (28 °C)	84 °F (29 °C)	88 °F (31 °C)	91 °F (33 °C)	95 °F (35 °C)	100 °F (38 °C)	105 °F (41 °C)	110 °F (43 °C)	116 °F (47 °C)	123 °F (51 °C)	129 °F (54 °C)	137 °F (58 °C)				
65	82 °F (28 °C)	85 °F (29 °C)	89 °F (32 °C)	93 °F (34 °C)	98 °F (37 °C)	103 °F (39 °C)	108 °F (42 °C)	114 °F (46 °C)	121 °F (49 °C)	128 °F (53 °C)	136 °F (58 °C)					
70	83 °F (28 °C)	86 °F (30 °C)	90 °F (32 °C)	95 °F (35 °C)	100 °F (38 °C)	105 °F (41 °C)	112 °F (44 °C)	119 °F (48 °C)	126 °F (52 °C)	134 °F (57 °C)						
75	84 °F (29 °C)	88 °F (31 °C)	92 °F (33 °C)	97 °F (36 °C)	103 °F (39 °C)	109 °F (43 °C)	116 °F (47 °C)	124 °F (51 °C)	132 °F (56 °C)							
80	84 °F (29 °C)	89 °F (32 °C)	94 °F (34 °C)	100 °F (38 °C)	106 °F (41 °C)	113 °F (45 °C)	121 °F (49 °C)	129 °F (54 °C)								
85	85 °F (29 °C)	90 °F (32 °C)	96 °F (36 °C)	102 °F (39 °C)	110 °F (43 °C)	117 °F (47 °C)	126 °F (52 °C)	135 °F (57 °C)								
90	86 °F (30 °C)	91 °F (33 °C)	98 °F (37 °C)	105 °F (41 °C)	113 °F (45 °C)	122 °F (50 °C)	131 °F (55 °C)									
95	86 °F (30 °C)	93 °F (34 °C)	100 °F (38 °C)	108 °F (42 °C)	117 °F (47 °C)	127 °F (53 °C)										
100	87 °F (31 °C)	95 °F (35 °C)	103 °F (39 °C)	112 °F (44 °C)	121 °F (49 °C)	132 °F (56 °C)										

	Caution
	Extreme caution
	Danger
	Extreme danger

TempAlert Demo

Iot Application: SpeedAlert

Objective: To alert a parent of a teenager that their child is speeding drastically.

What does it do?

- Sense vehicle's speed
- If threshold speed reached, send alert via 3G to server (IFTTT) to user

Speed Alert Demo

Hardware Budget

Extension		
	Price per Unit ($)	
Item	**per 1**	**per 1000**
MQ2 (Gas)	6.90	5.52
SHT10 (Hum/Temp)	13.44	6.60
HC-SR501 (PIR M.)	1.17	0.91
Camera	49.95	49.95
HC-05	3.04	2.99
U3V12F5 (Step Up 5 V)	3.95	2.99
Enclosure (PLA)	1.46	1.46
Particle Photon	19.00	19.00
Capacitors (47uF 16V)	0.33	0.08
Capacitors (100uF 25V)	0.64	0.21
PCB Extension	11.85	0.43
Total Extension	111.73	90.14

Hub		
	Price per Unit ($)	
Item	**per 1**	**per 1000**
STN1110	9.49	7.64
MCP2551	0.9	0.68
Particle Electron	69	49
DB9	2.11	1.17
Encloser	3.09	2.08
OBD2 Connector	5.15	5.15
GPS	39.5	31.96
Resistors	1.8	0.24
Capacitors	6.78	2.7
16 MHz	0.95	0.76
D24V22F3 (Step Down 3.3 V)	8.95	6.26
D24V22F5 (Step Down 5V)	8.95	6.26
PCB Hub	11.85	0.56
Total Hub	168.52	114.46

To Make One: $280.25

To Mass Produce: $204.60

Questions?

Thank You!!!