

Hurricane Activated Window Closers

Concept

Detects hurricane conditions, then sends out a signal to automatically close shutters



silverB 10/22/2009

What is a hurricane shutter?

Prevents debris from breaking windows leading to high pressure build-up, which can tear off the roof.



Products on the market: motorized shutters, manually installed panels.

Need for Automatic Detection

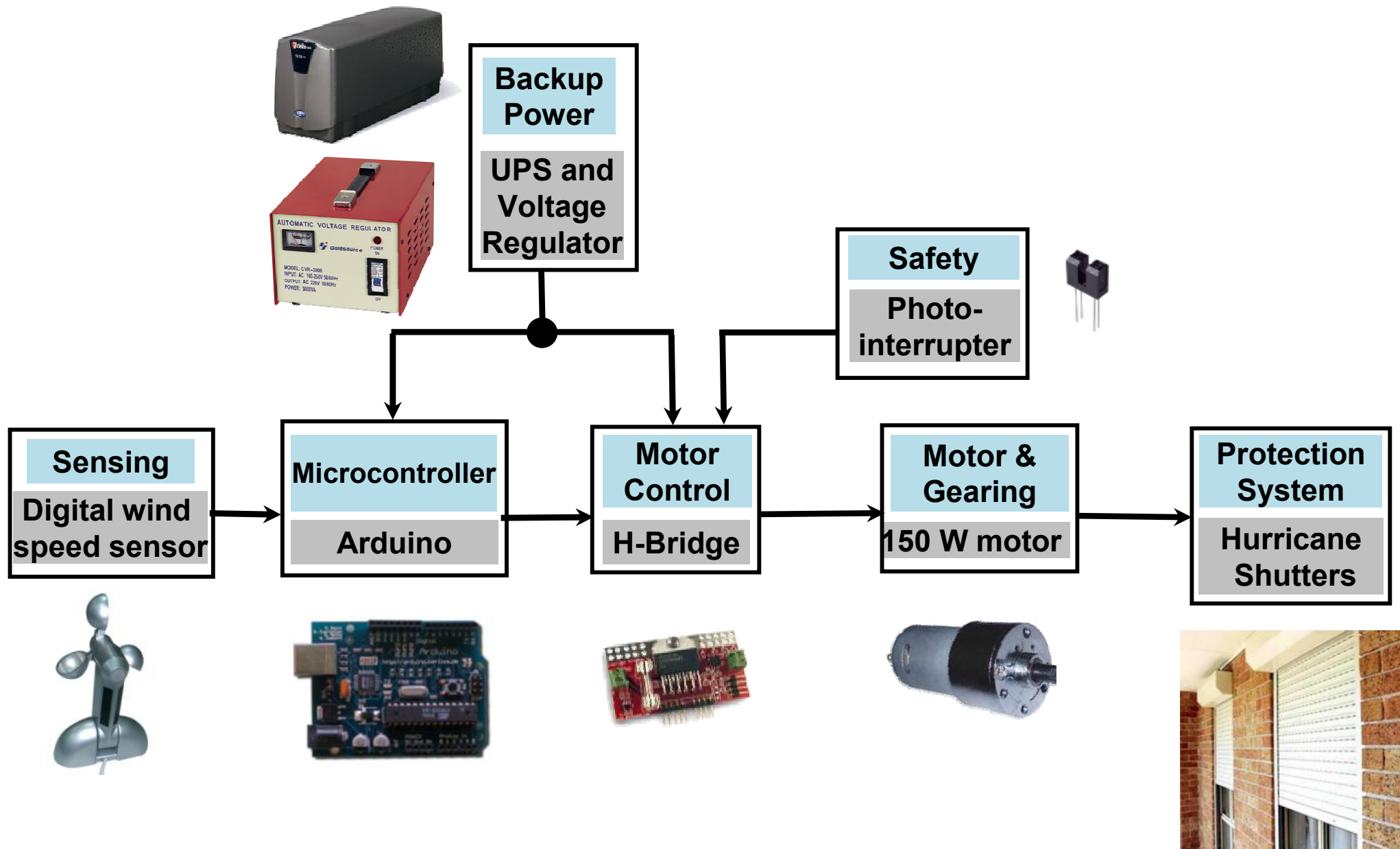
- High risk areas' building code often requires hurricane shutters
- Issues with preparing a house for a hurricane
 - Can take up to a day
 - Labor intensive
 - Dangerous: cause of 100 deaths in Hurricane Rita

Product Differentiation

Completely autonomous

- Real-time weather sensing
 - 70 mph wind speed
- Minimizes user effort
- Emphasis on safety

Critical Module: Sensing - Motor



Market & Costs

Target customers:

vacation home owners, multi-story dwellings, elderly

Component of Product	Estimated Sale Price	Basis for Estimate
Central Controller	\$200 - \$300	Home weather sensors, monitoring systems
Add-ons per Window	\$100	Motor + sensors

Motorized steel shutters = \$30 per sq. ft + installation costs
=> upwards of \$50,000 per home

Contract

Product description: Device detects hurricane conditions & automatically triggers shutters.

Intended customers: Homeowners in hurricane prone regions.

Market: Hurricane protection products.

Customer Need	Product attribute	Engineering Specification
Reliability	Product lifespan	> 10 years
Can deploy quickly	Time for closing and opening shutters	$\leq$ 1 minute
Operates when power in home is out	Cycles of operation without power	> 2 cycles
Few false positives	False positives per season	$\leq$ 1 per season
Low installation costs	Price per window	$\leq$ \$300

Major Risks

- Does it sense a hurricane?
 - What defines hurricane conditions?
- Does it react to weather data?
 - Sensor/motor interface
- Market acceptance & usability
 - Retrofitting current systems
 - Working with contractors?

Risk Resolution

Risks	Testing	Validation
Sensing	Wind sensing	Tested up to 50 mph
Actuation	Motor response	Limit switches & proper directions
Market	Interviews	Confirmation of need – D. Griffin (FDEM)

Future investigation

- Realistic conditions
- Use network data to cross-check detection system
- False positives