

Hello Electric League!



Douglas W. Ehlers, PE – Reinventing the Circuit Breaker
Atom Power, Inc.



About the Speaker –

Degreed and licensed P

Interdisciplinary knowle

Designed modifications
increase safety and effic

Electrical expert for for

Solutions specialist for A

First and only “Shocking
in East Africa



Atom Power

Founded in 2014 in Charlotte, NC with a mission to save lives and facilities, and simplify power distribution with solid-state innovations.

Our investors:

SIEMENS

ABB

EAT•N



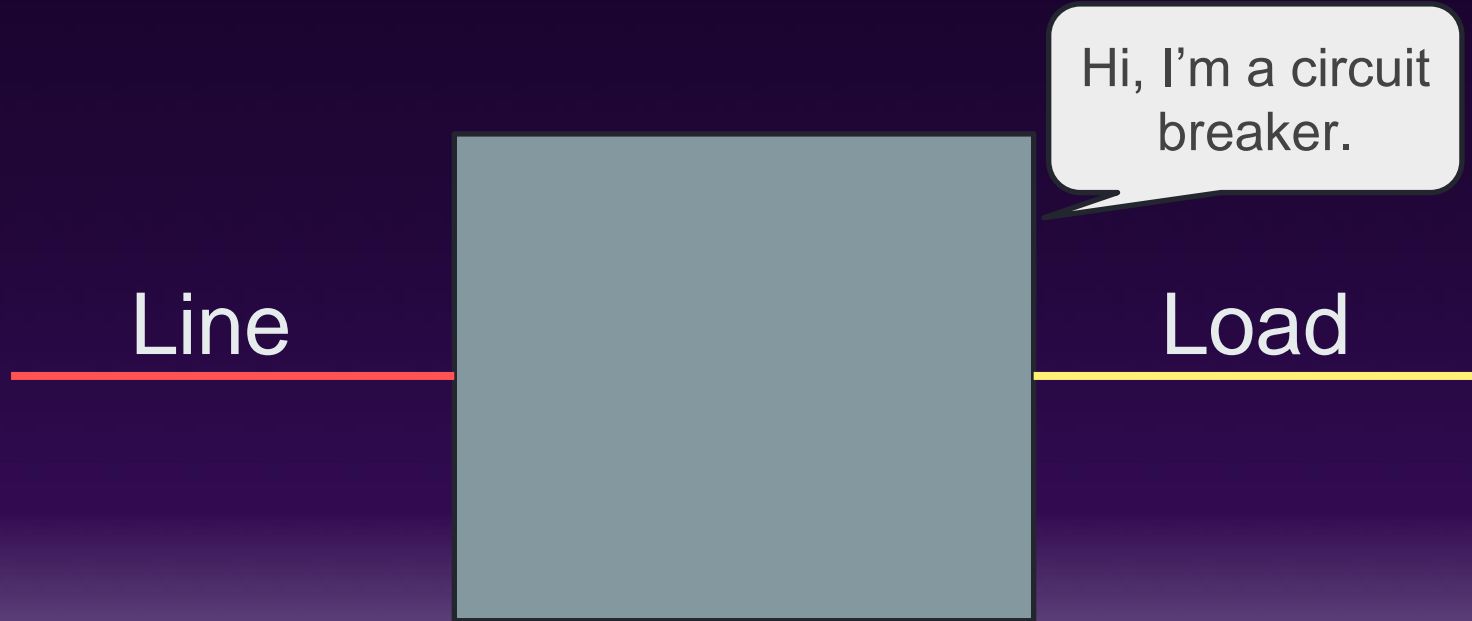


If you could reinvent the
circuit breaker...

What improvements would
you make?

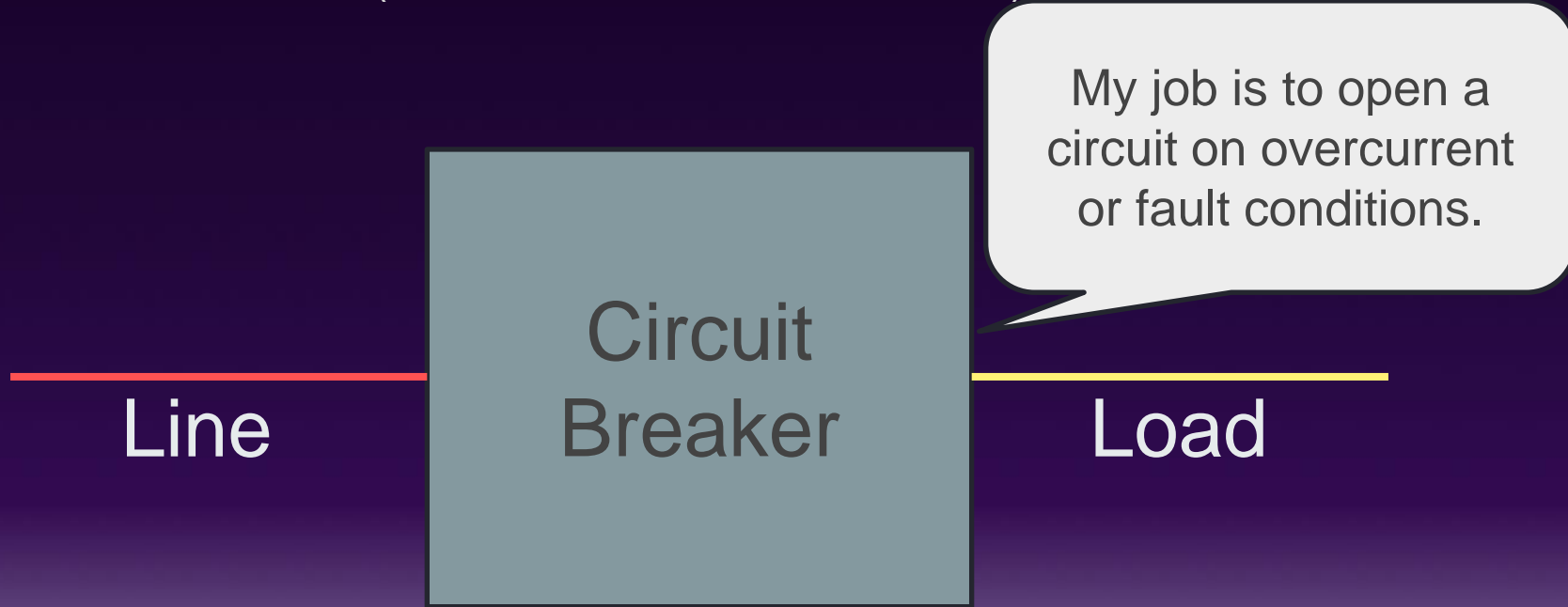
The Circuit Breaker

(Assume the circuit breaker is a box)



The Circuit Breaker

(Assume the circuit breaker is a box)



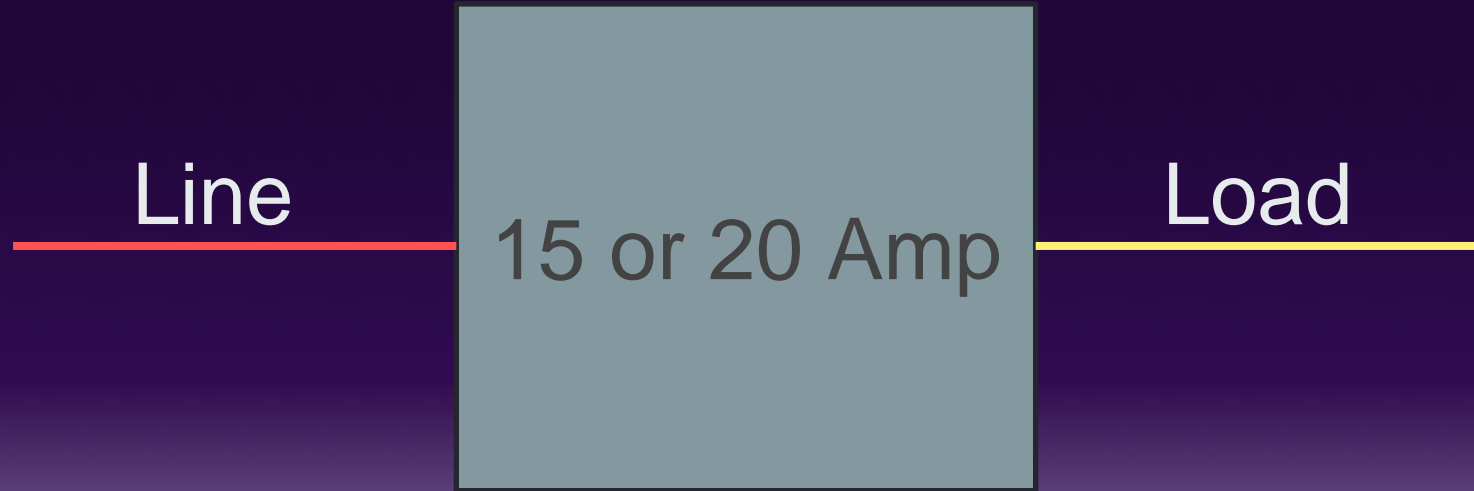
The Atom Switch

(Now, assume the box is a Solid-State Circuit Breaker)



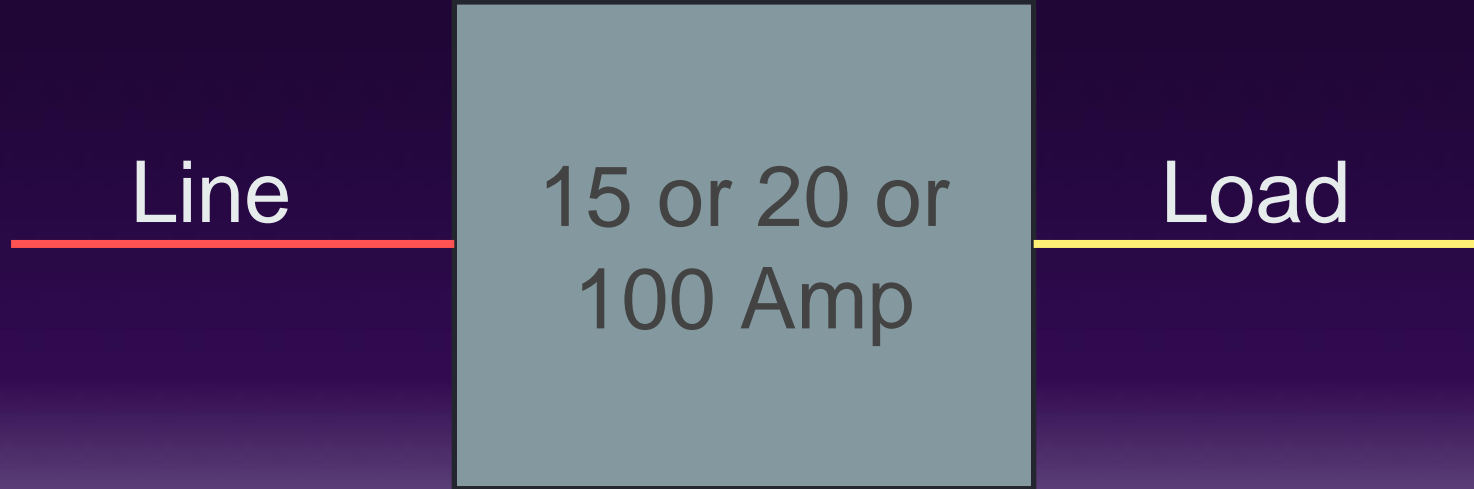
The Atom Switch

(Solid-State Circuit Breaker)



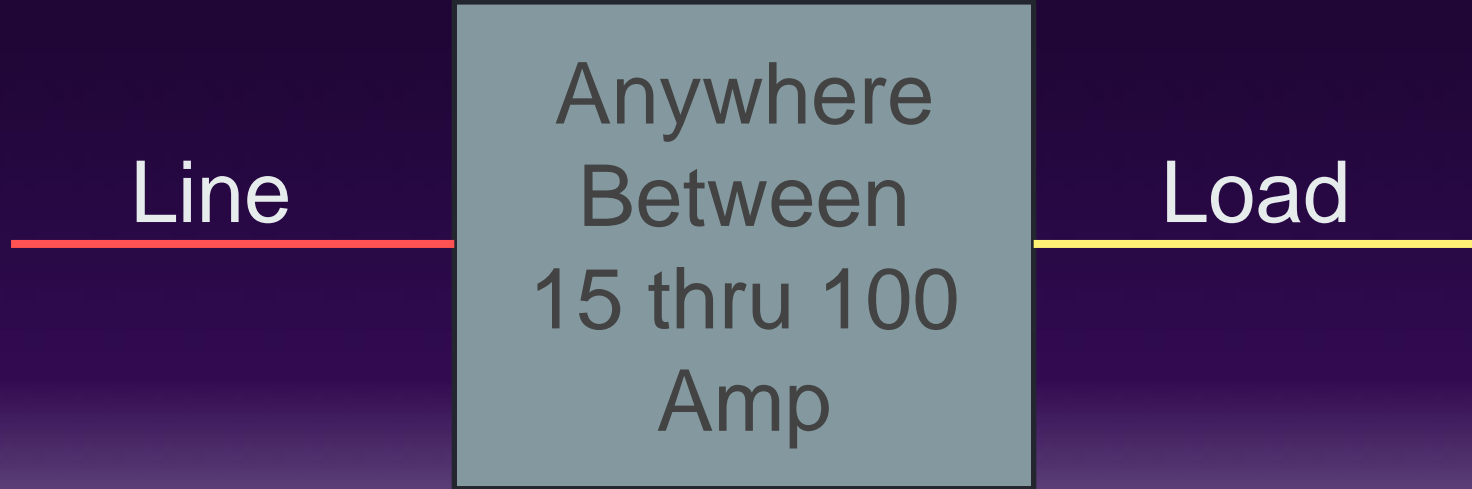
The Atom Switch

(Solid-State Circuit Breaker)



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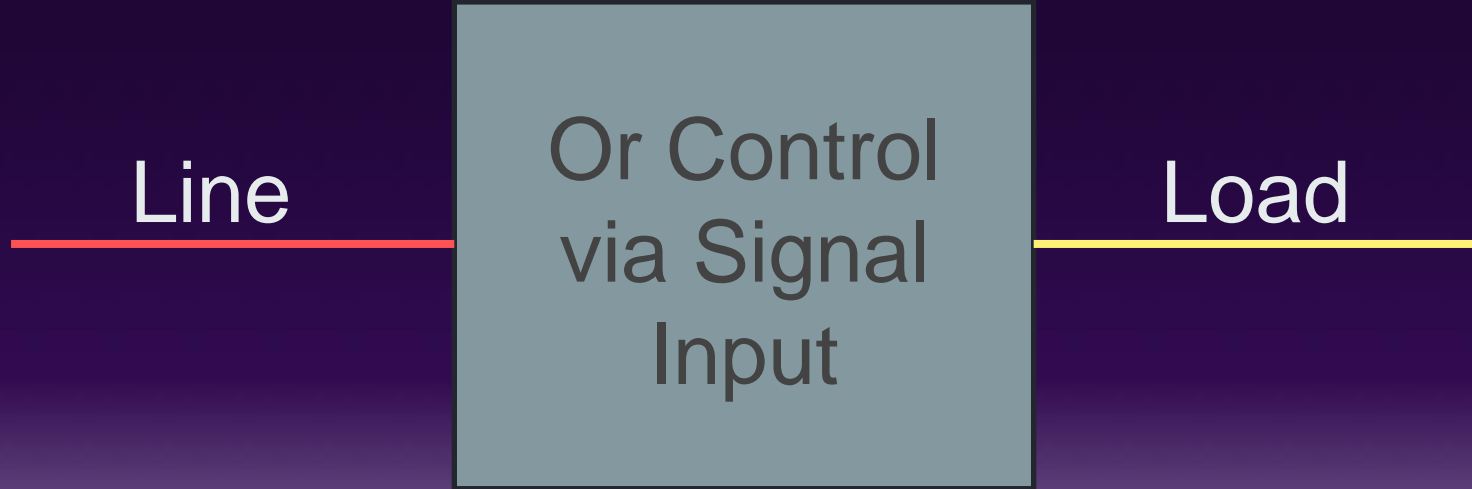
The Atom Switch

(Solid-State Circuit Breaker)



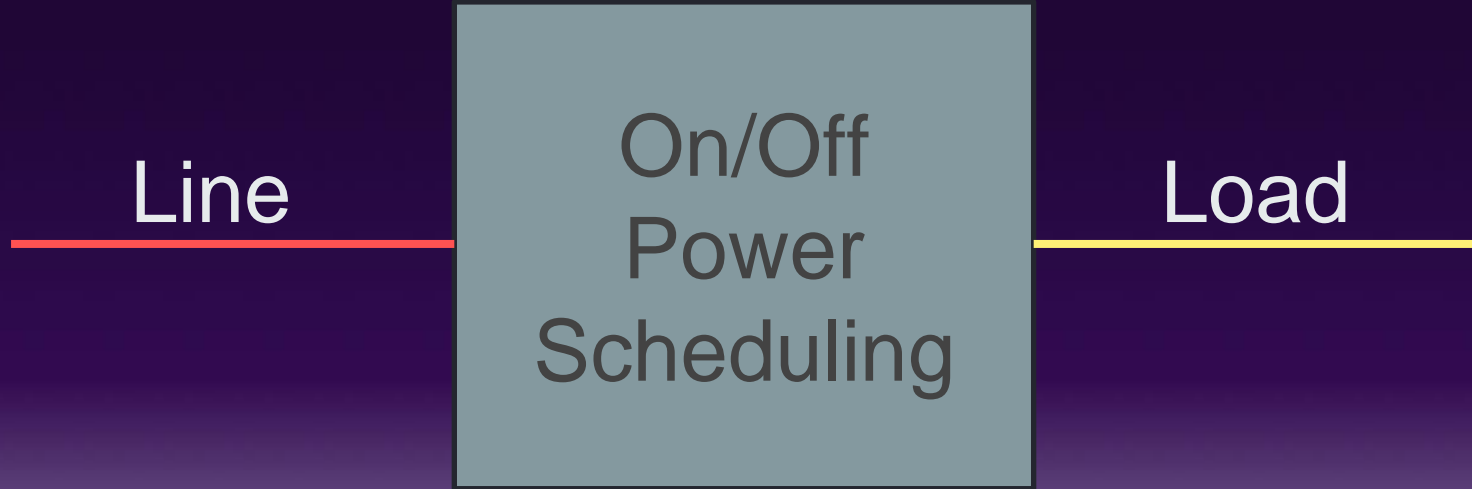
The Atom Switch

(Solid-State Circuit Breaker)



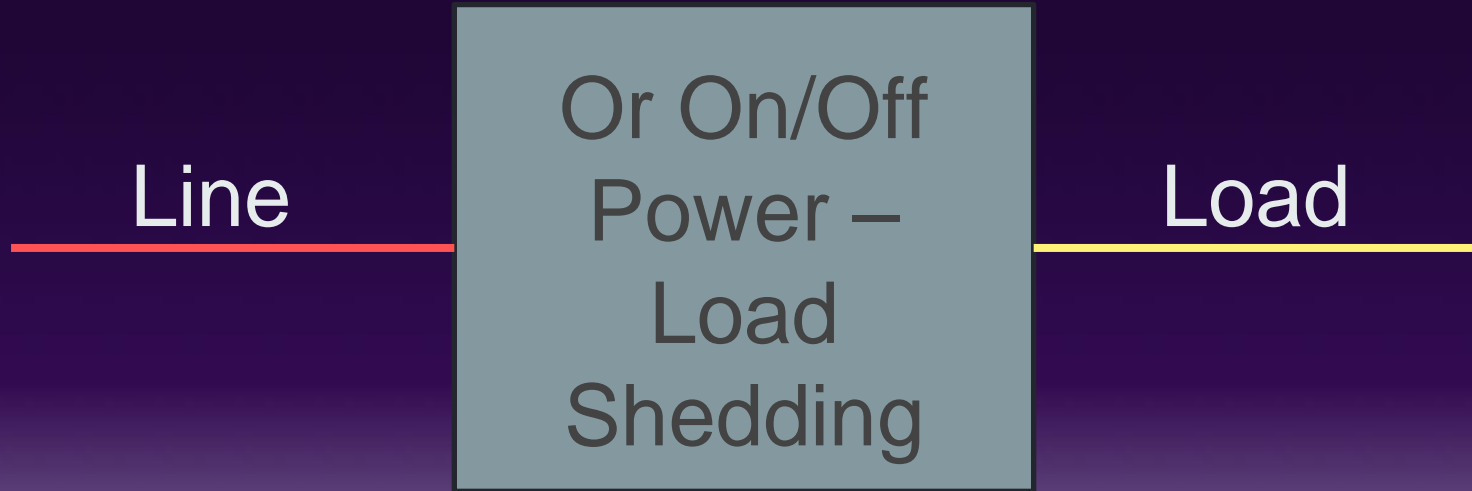
The Atom Switch

(Solid-State Circuit Breaker)



The Atom Switch

(Solid-State Circuit Breaker)



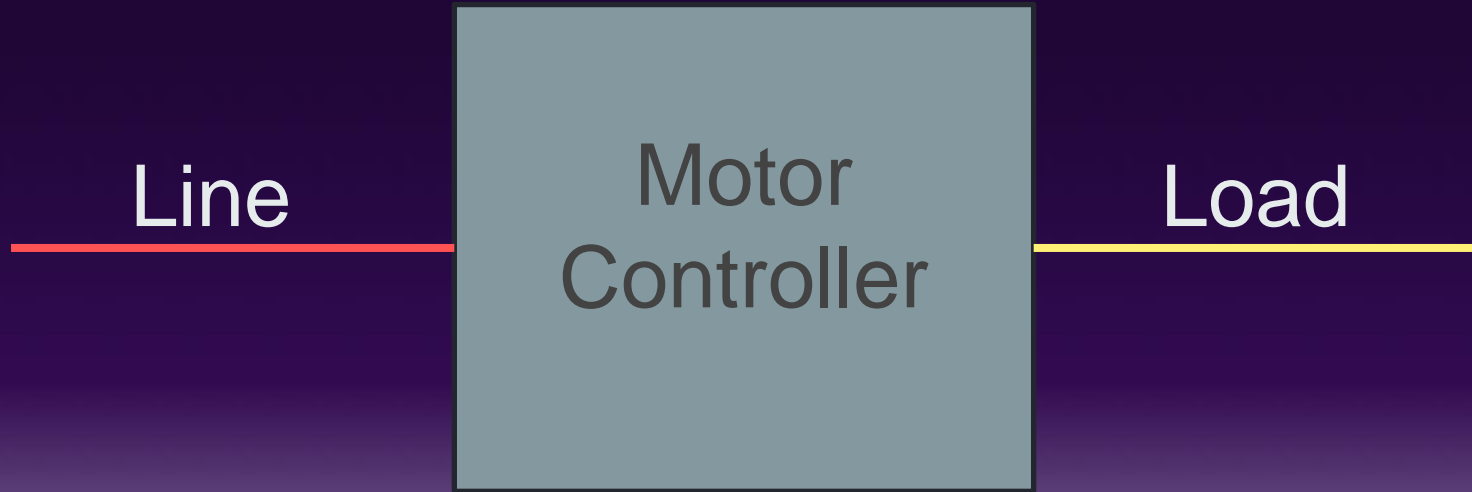
The Atom Switch

(Solid-State Circuit Breaker)



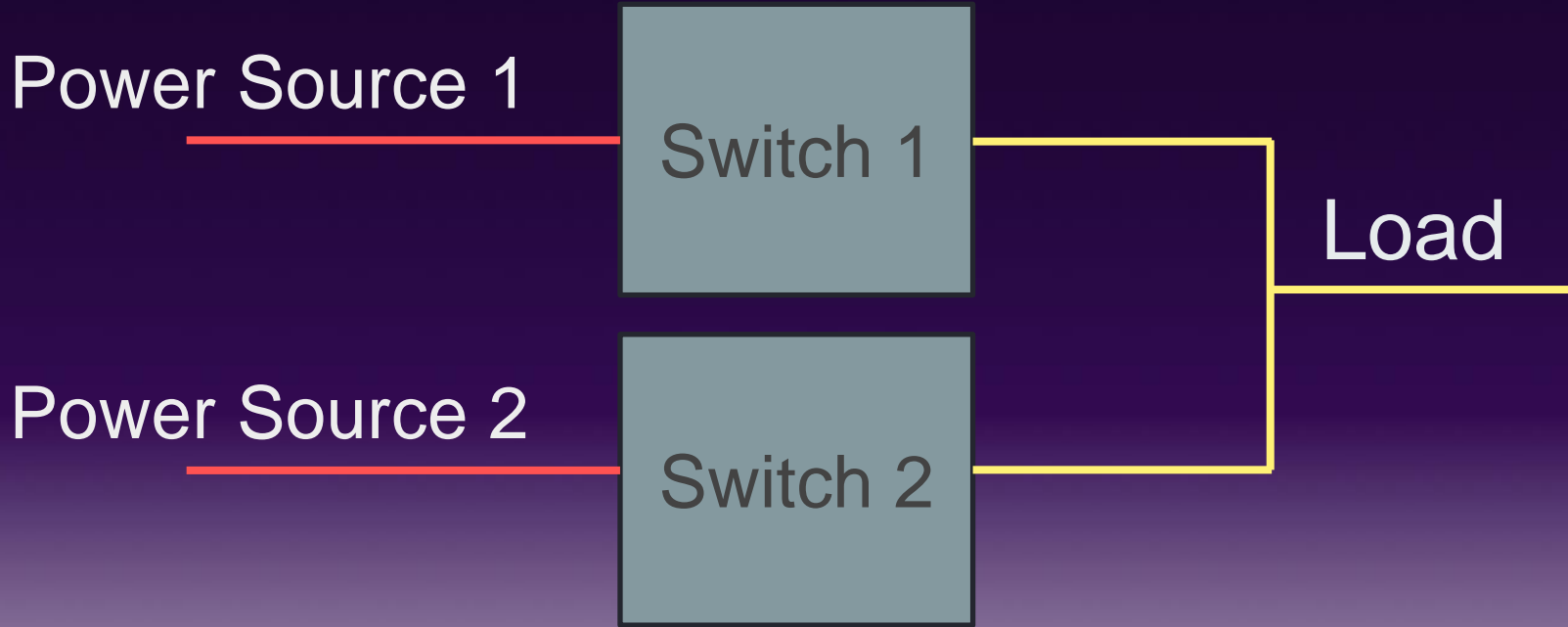
The Atom Switch

(Solid-State Circuit Breaker)



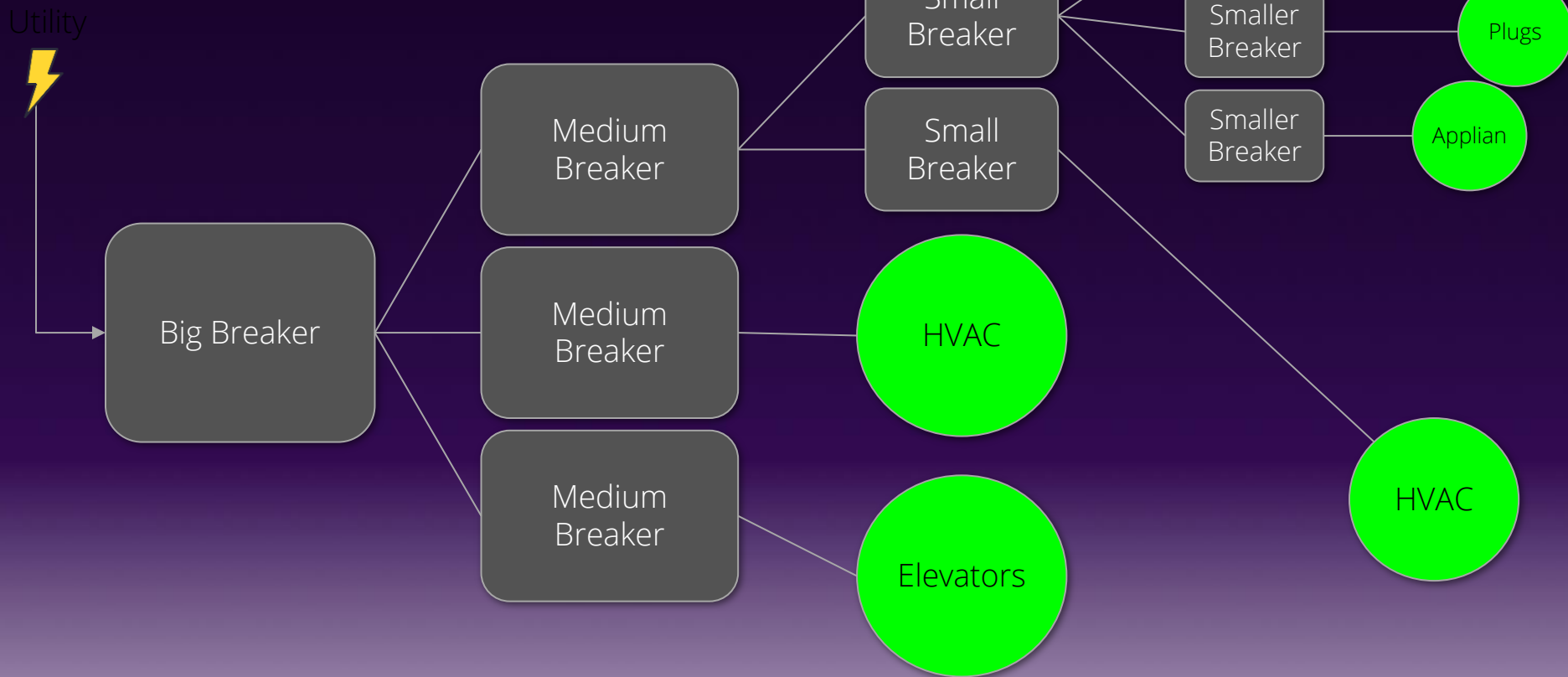
The Atom Switch

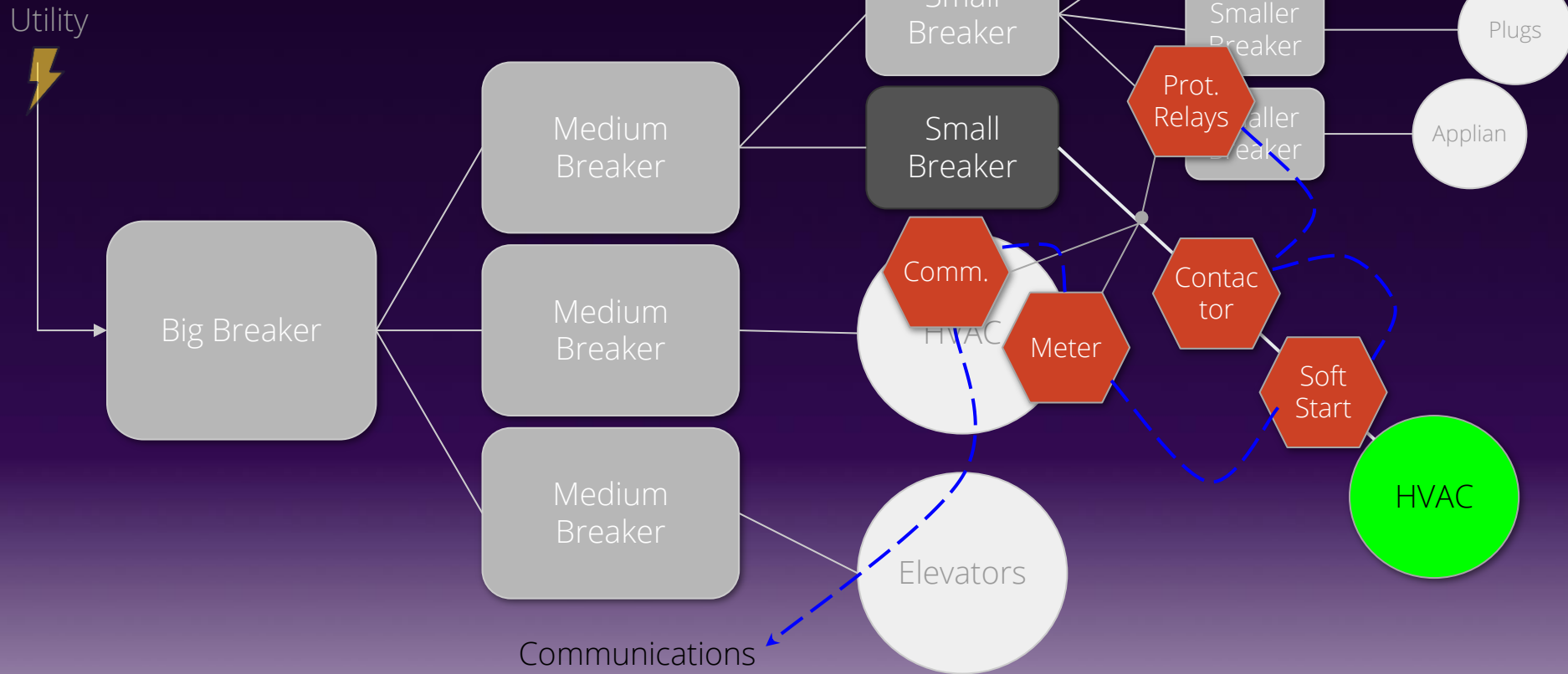
(Solid-State Circuit Breaker)



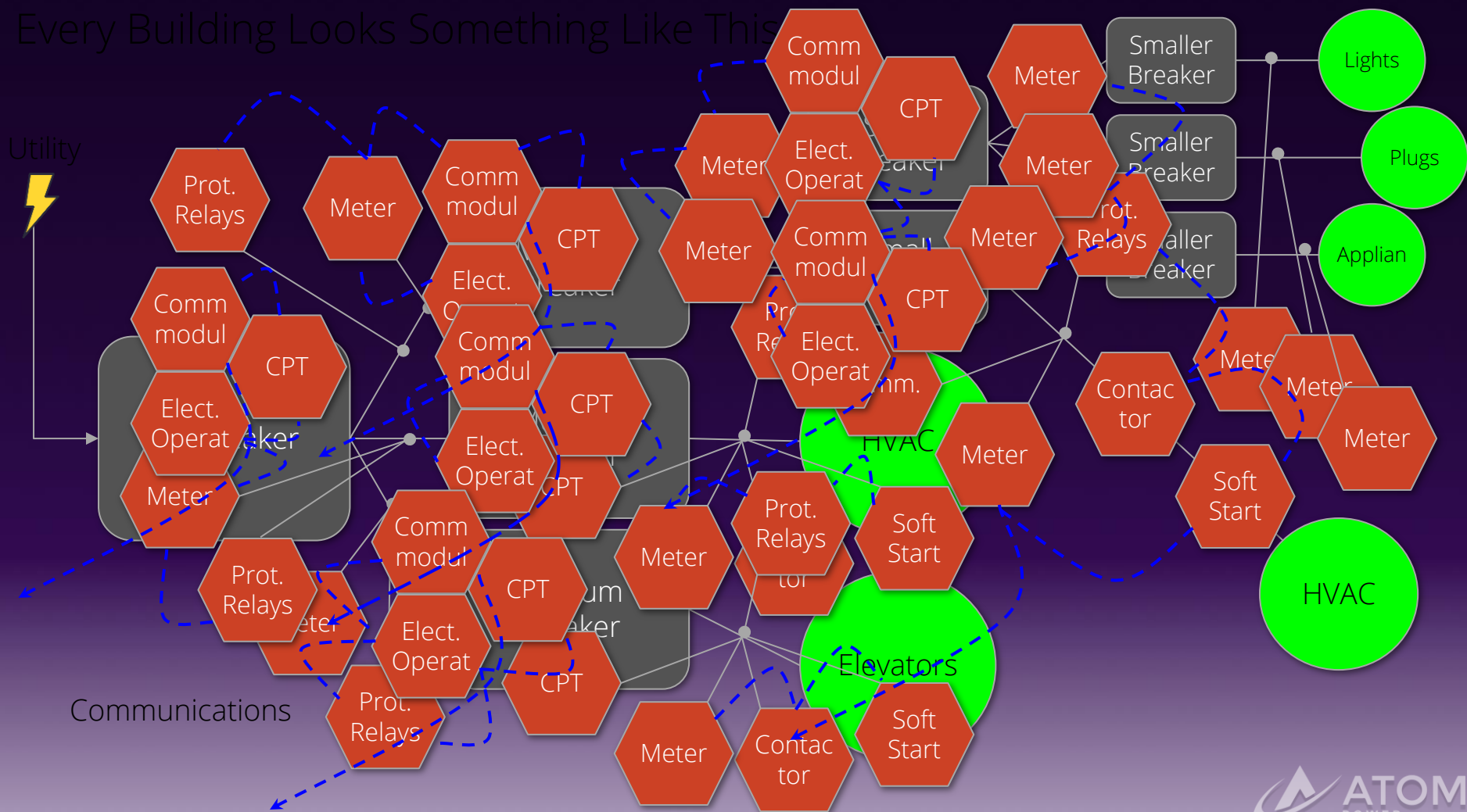
Can Backfeed Through Switches!

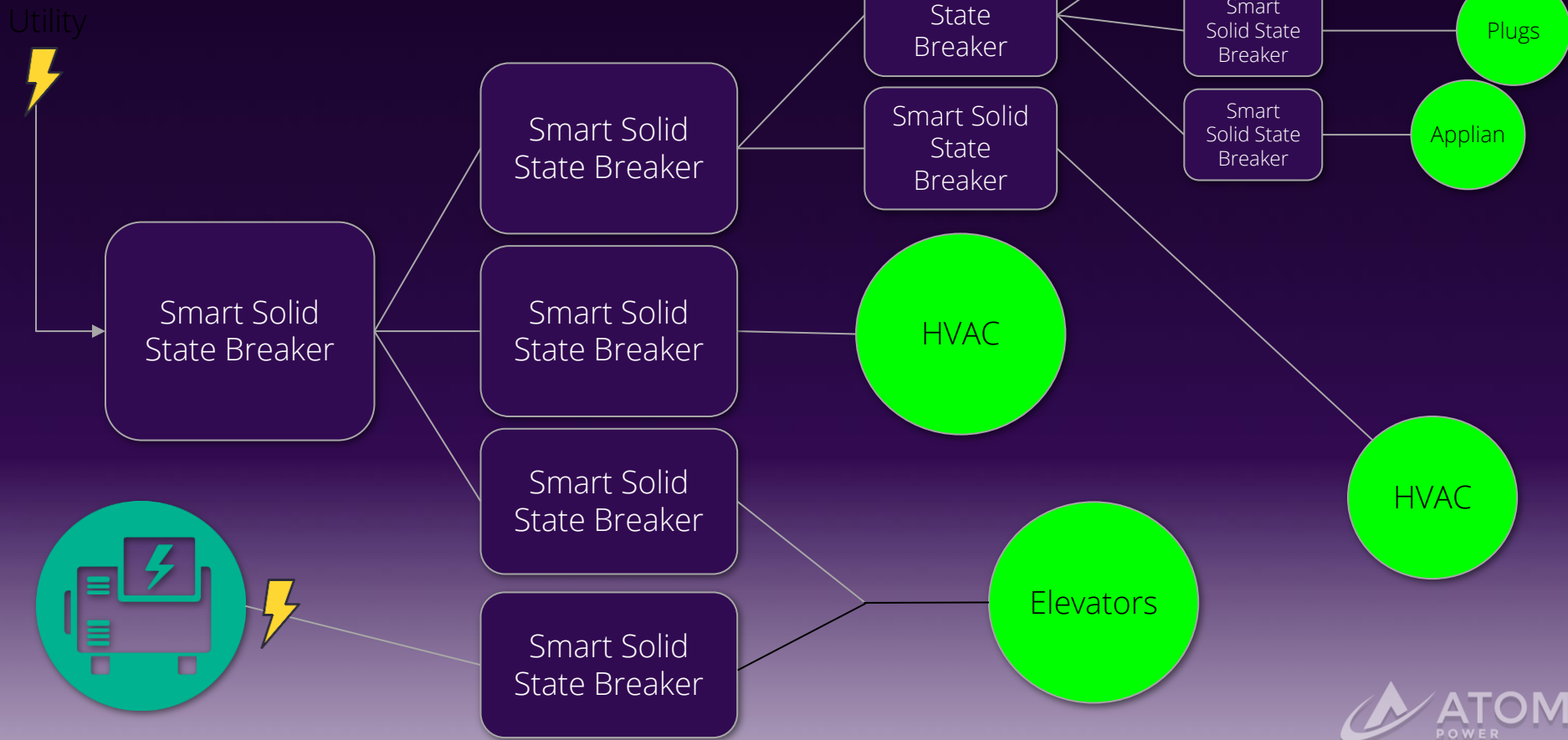
Every Building Looks Something Like This....





Every Building Looks Something Like This

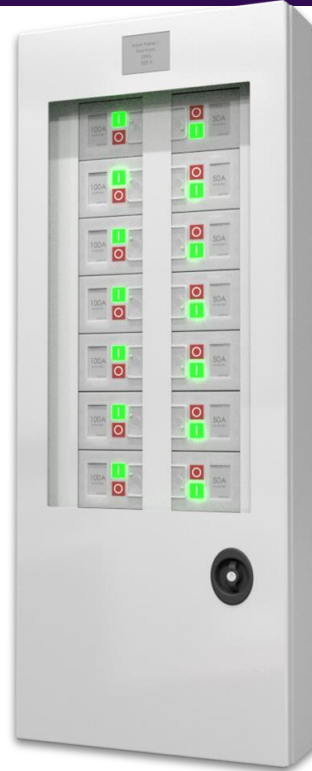




Atom Power Solid-State Distribution with Atom Power OS



Atom Switch™
(Circuit Breaker)



Atom Panel™
(Aggregator)



Atom OS™
(Interface)

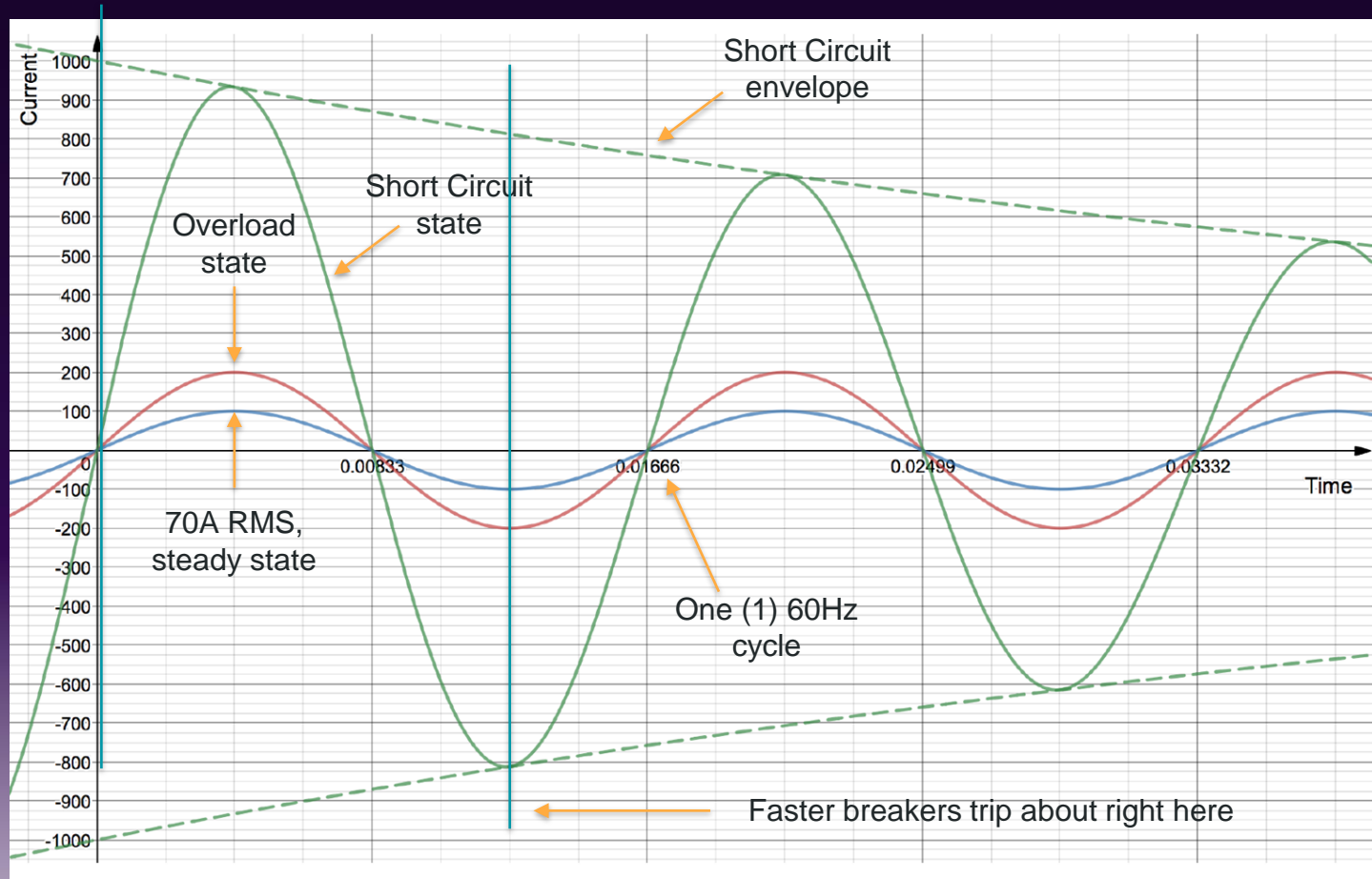
20 ms
(Mechanical Breaker)

Vs.

3 μ s
(Atom Switch)

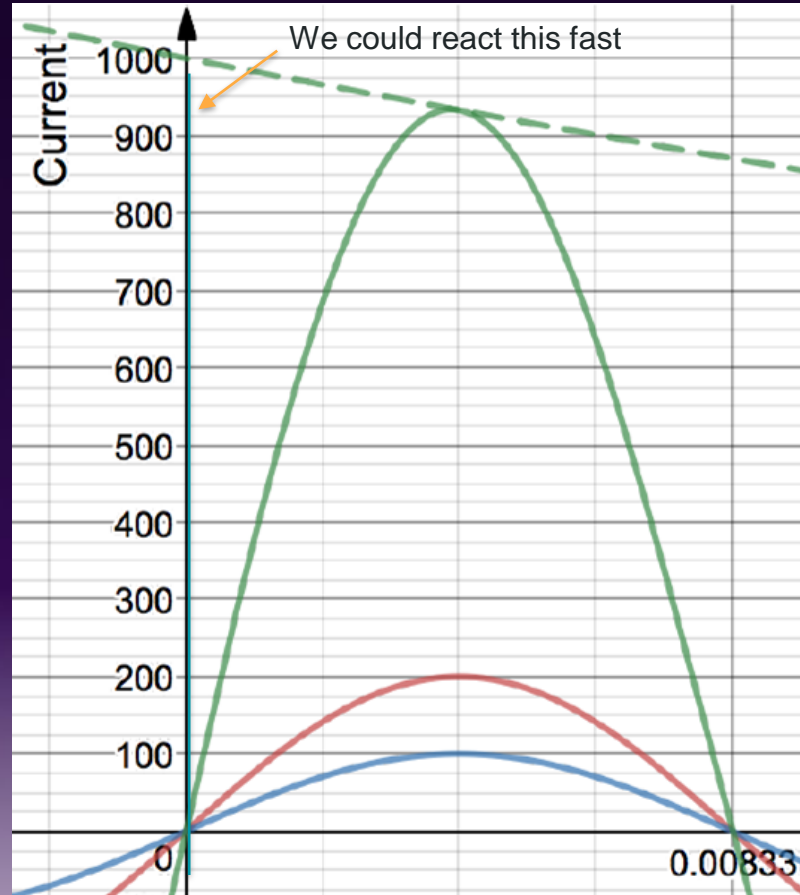
Thousands of times faster!

Circuit Breakers Today



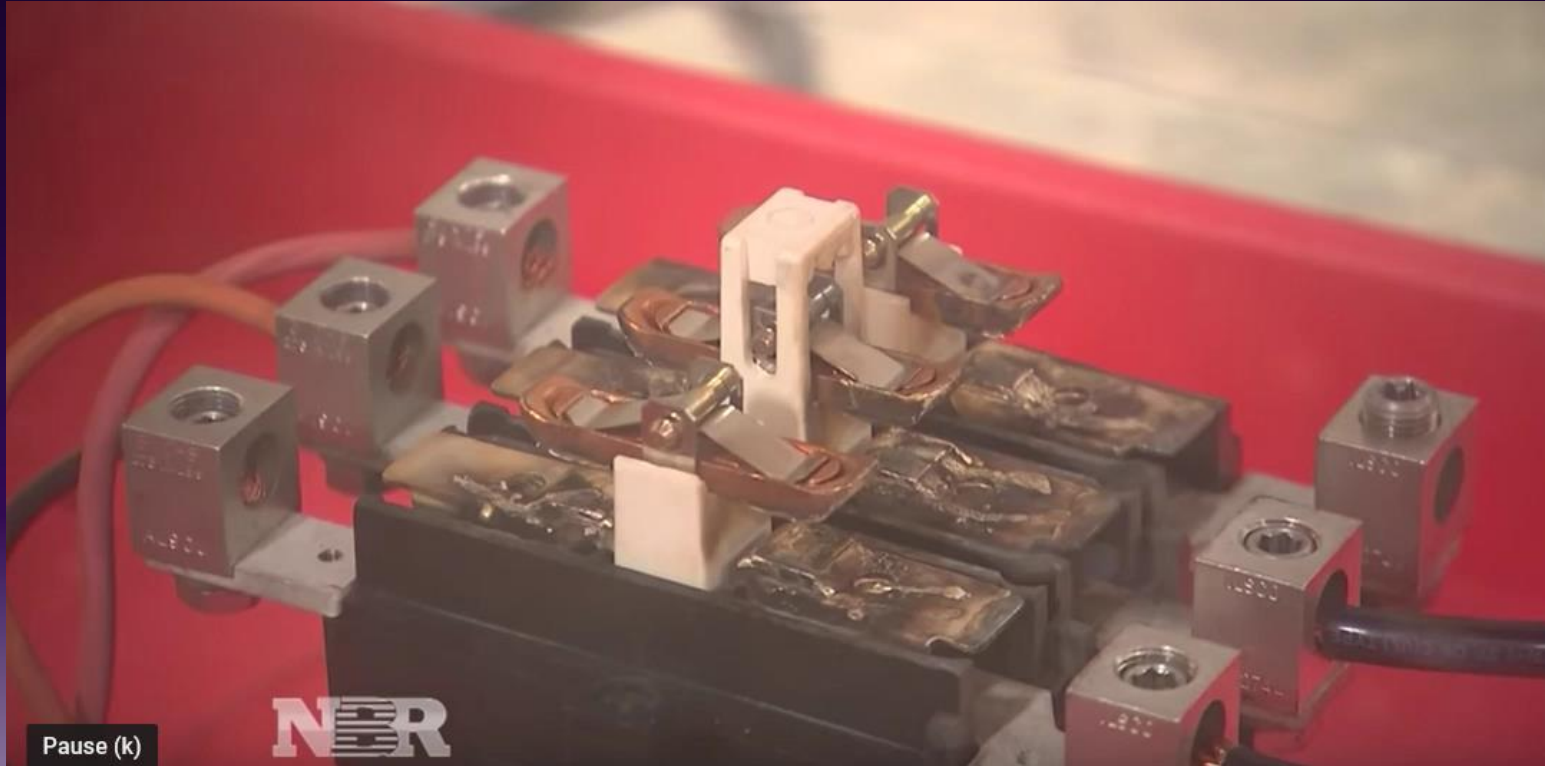
100A circuit
breaker
example

What if?



Energy does not
have time to build
up!

Phase to Phase Short



Pause (k)

N**R**

Phase to Phase Short



Electric Vehicle Charging

Automatic Transfer

Current Limiter

APPLICATIONS?

Cat. 0 Arc Flash Hazard

Motor Control Center

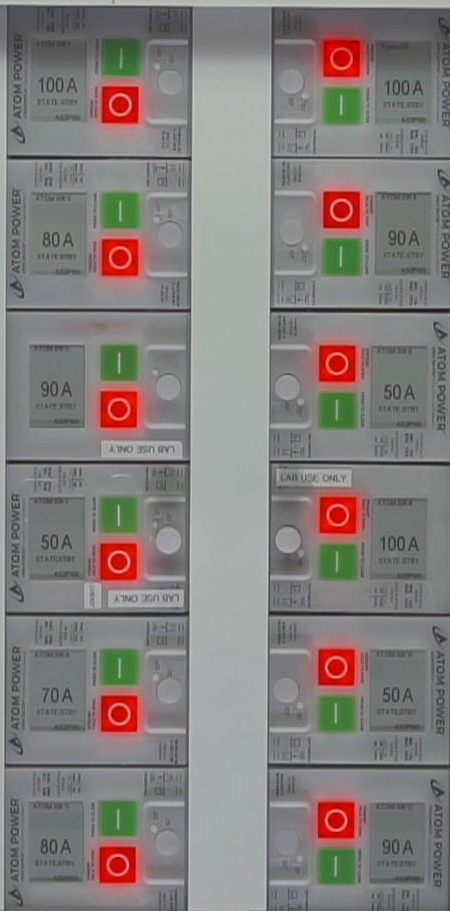
Remote/Auto Control
Power Management

Other Applications

It's also a Circuit Breaker

Atom Pool
PID 9908
utility
800/277
220A

PANEL #3
IP: 192.168.0.11



AtomOS
Ver 1.6

Email:

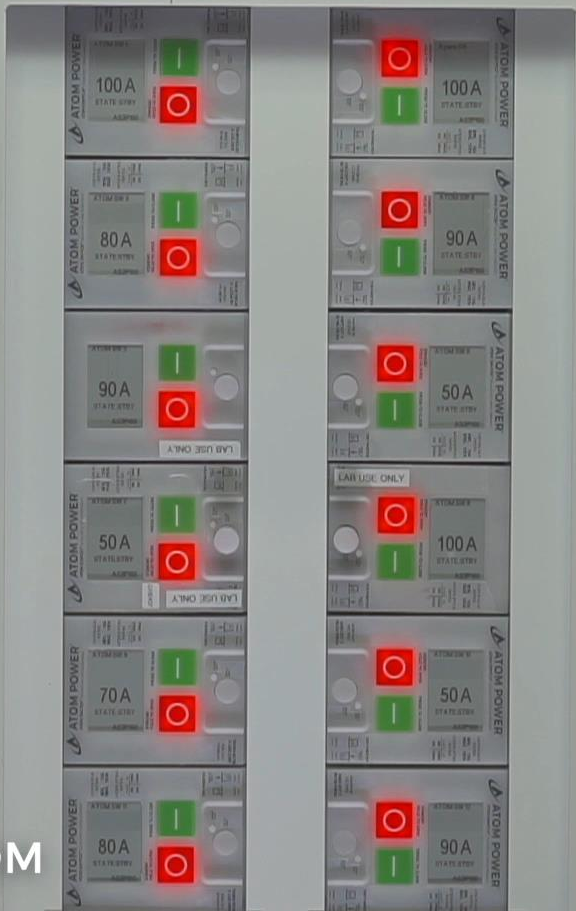
Password:

 Sign In

[Forgot password](#)

Atom Panel
FEDFROM
utility
08/6/2017
228A

PANEL #3
IP: 192.168.0.11



AtomOS
Ver 1.6

[<= Return to AtomPanel](#)

[All Panels](#)

[Schedules](#)

[Users](#)

[Log](#)

[Profile](#)

[U](#)

Current Owner: ryank

STANDBY: MANUAL

ATOM SW 4

90A

STANDBY

AS3P100

Push
To
Close



Push
To
Open

Firmware Version:1.0

Feeds : HVAC

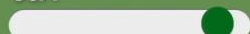
VOLTS 480 V

AMPS 0 A

kVA 0kVA

TEMP 65 °F

90A



15A Breaker Rating (LT Trip) 100A

20s



0s Short Time Trip 20s

600A



90A Instantaneous Trip 600A

Apply

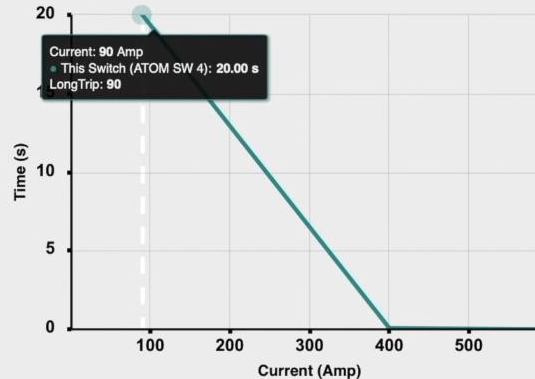
Discard

TCC
PLOT

Linear



Logarithmic



— This Switch (ATOM SW 4)

Coordinated Switch

Click button below to add switches and ch

ryank

Current Owner: ryank

STANDBY: ATOM OS

Demo switch

100A

STANDBY

AS3P100

Firmware Version:1.0

Push
To
Close



Push
To
Open

Feeds

: HVAC

VOLTS

480 V

AMPS

0 A

kVA

0kVA

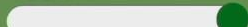
TEMP

65 °F



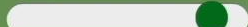
Menu

100A



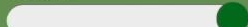
15A Breaker Rating (LT Trip) 100A

18s



0s Short Time Trip 20s

600A



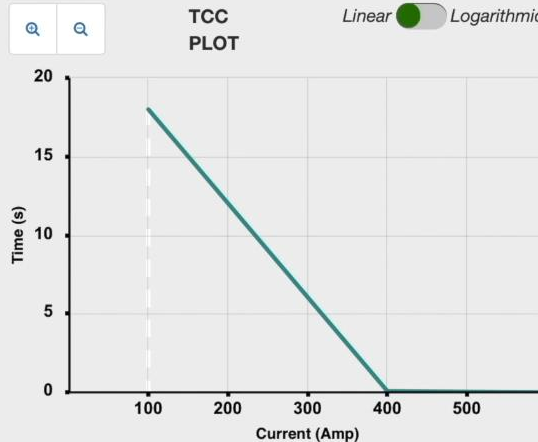
100A Instantaneous Trip 600A

Apply

Discard

TCC PLOT

Linear ☒ Logarithmic



— This Switch (Demo switch)

Coordinated Switch

Click button below to add switches and ch

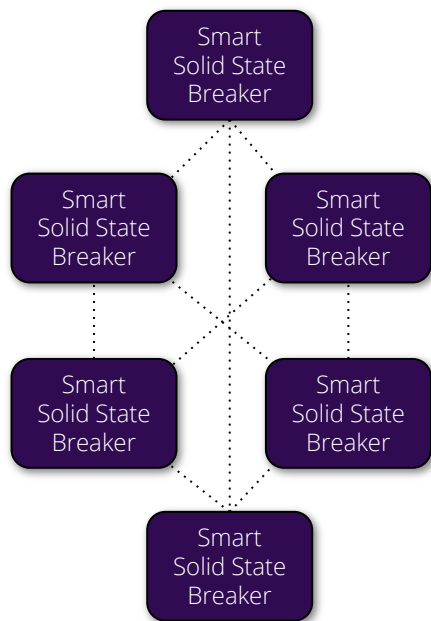
ryank

Tomorrow...

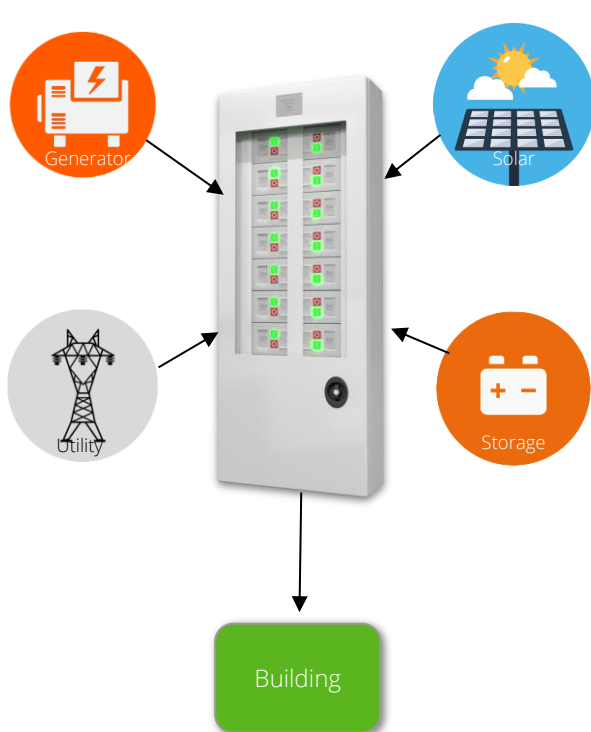
Artificial Intelligence

DER (Distributed Energy Resources)

Self-Maintenance



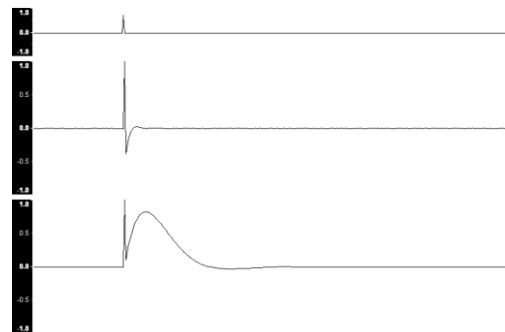
Self-Coordination



Self-Injection Testing

Self Thermal Testing

Impulse Function Prediction



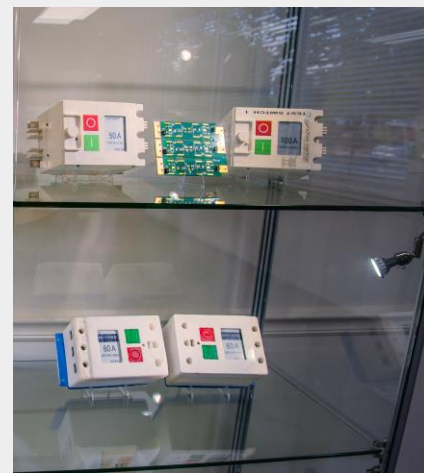
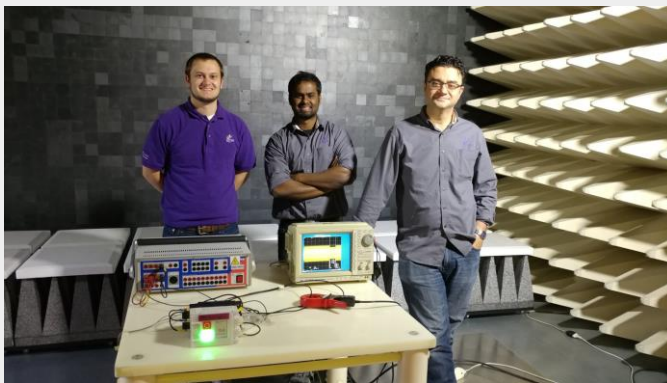
We are just starting...

Join us.



Designed & Built in Charlotte, North Carolina

www.atompower.com



Atom Power, Inc.
10420 Harris Oaks Blvd.
Suite Q
Charlotte, NC 28269

Questions Please

A Summary of things the Atom Switch can do...

- Arc Flash Mitigation (low impedance faults)
- Destructive Short Circuit Hazard Mitigation
- Ultra Fast Circuit Protection - **Able to sense and open circuit in 3μs.**
- 150,000-amp interrupting capacity
- Remote operation - each Atom Switch is remotely controllable through Atom OS™ or via sensors, dry contacts
- Dynamic Time-Current Curve Adjustment and Coordination between Atom Switches - each Atom Switch can be set 15-100 amps
- Remote Firmware Update Capability **for additional functionality**
- Easily networked with one (1) IP address for the whole Atom Power Ecosystem
- ***Motor Soft-Starting** capability with ramp-up and ramp-down time adjustable from 1-30 seconds
*Functionality in development
- Integrated Metering:
 - Volts
 - Amps
 - Power
- Integrated relay functions:
 - Under/over voltage protection
 - Under/over current protection
 - Under/over frequency protection
 - Phase loss protection
- Power Scheduling and Load Shedding
Schedule equipment power on/off or set priority to shed or restore power to loads
- Event Log auto-saved
- Autonomous - Firmware embedded into each Atom Switch, enabling autonomous, fail-safe operation
- Integral lockout/tagout air gap mechanism