

# Bite of Science

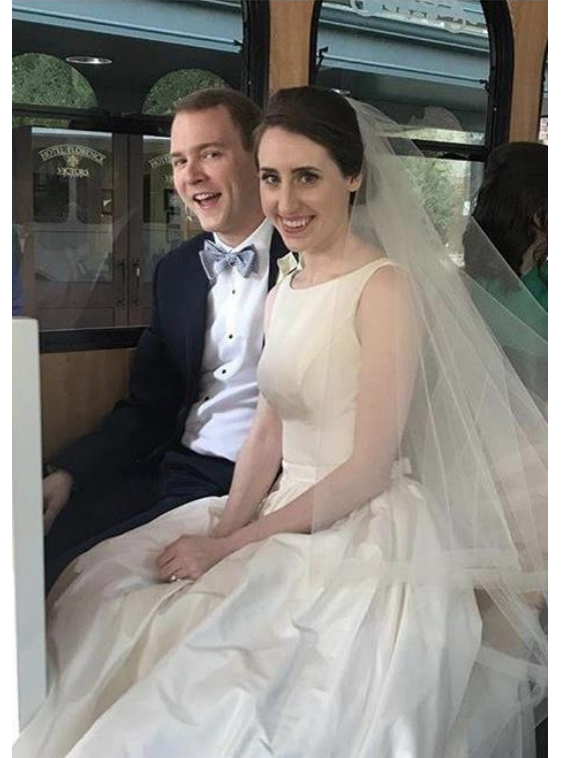
Nolan B. Mikell  
Applications Engineer, ABB Inc.



Power and productivity  
for a better world™

# Nolan B. Mikell

- Electrical Applications Engineer at ABB Inc.
- Husband
- Guitarist
- Yard Work Enthusiast
- Church Volunteer



# Education and Experience

- Wilson High School - International Baccalaureate
- USC - Bachelor of Science in Electrical Engineering



- Pee Dee Electric Cooperative - Intern
- Johnson Controls, Inc. - Process Engineer
- ABB Inc. - Applications Engineer



## Four Business Units

- Robotics and Motion
- Industrial Automation
- Power Grids
- **Electrification Products**
  - Low Voltage Products
  - Electric Vehicle Chargers
  - Solar Inverters
  - UPS and Power Conditioning
  - **Medium Voltage Products**

# Robotics and Motion

Motors and Generators

Drives

Robotics (YuMi)



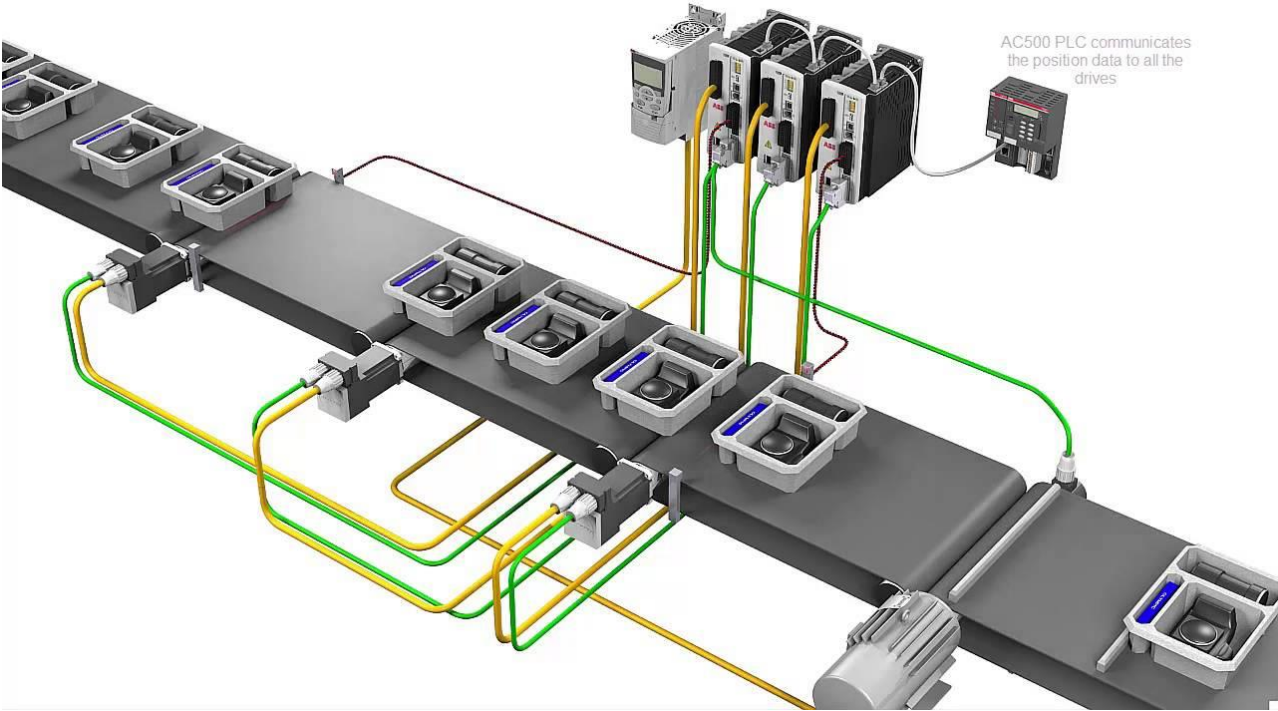


# Industrial Automation

Control Systems

Programmable Logic  
Controllers

Machine and Factory  
Automation



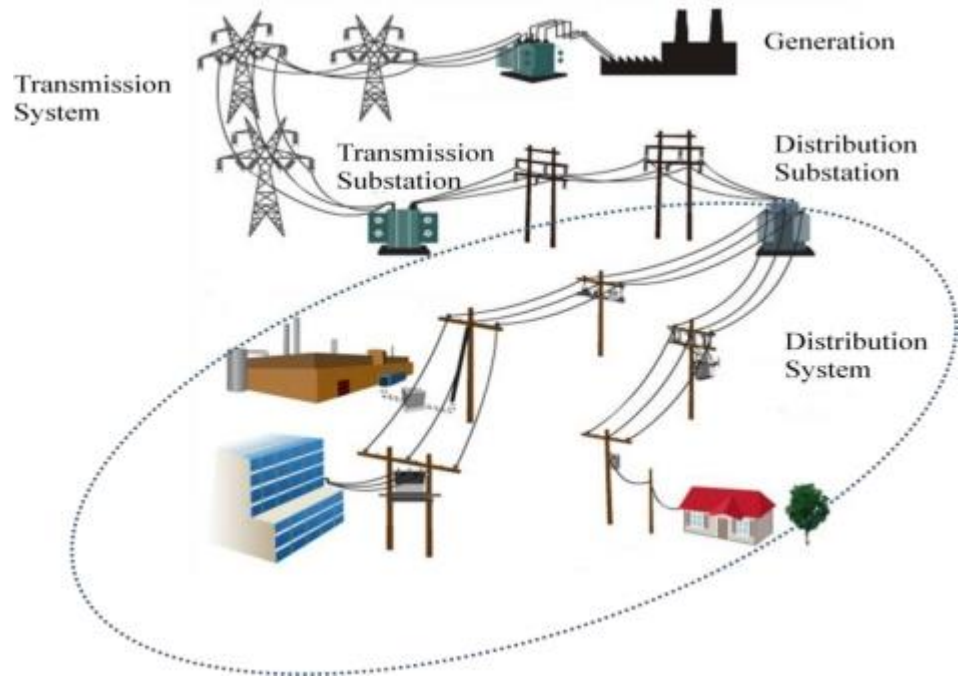
# Power Grids

High Voltage Products

Transformers

Substations

Grid Networks





# Electrification Products

Medium Voltage Products

Low Voltage Products

Solar Inverters

UPS and Power Conditioning

Electric Vehicle Chargers



# ABB in Florence, SC - Medium Voltage Service

**Electrification Products → Medium Voltage → Service**

Product Support Center

- Replacement Parts
- Refurbishments
- Evaluations
- Field Service

Primarily refurbishing and supporting breakers and switchgear constructed 1950's - 1990's



# They Don't Make Them Like They Used To...

Well, actually we do - they're just expensive!

- Manufacturing “Legacy” circuit breakers designed in the 1950's
- Cost \$40,000 - \$70,000 per breaker



ITE LK-1600



ITE 15HK-500

# ...but we also have a “Roll-in Replacement”

Cover a wide spectrum of legacy breakers

- ITE/ABB
- GE
- Westinghouse
- Cutler Hammer
- Federal Pacific
- McGraw Edison



These solutions are reliable, easier to maintain, and much more cost effective.

# My Role

- Engineering review of any order type
  - Customer Requirements
  - Draft a Bill of Material
- Drafting wiring diagrams for new breakers in AutoCAD
- Support for the shop floor

# Field Wiring Modifications



# Ultra Fast Earthing Switch



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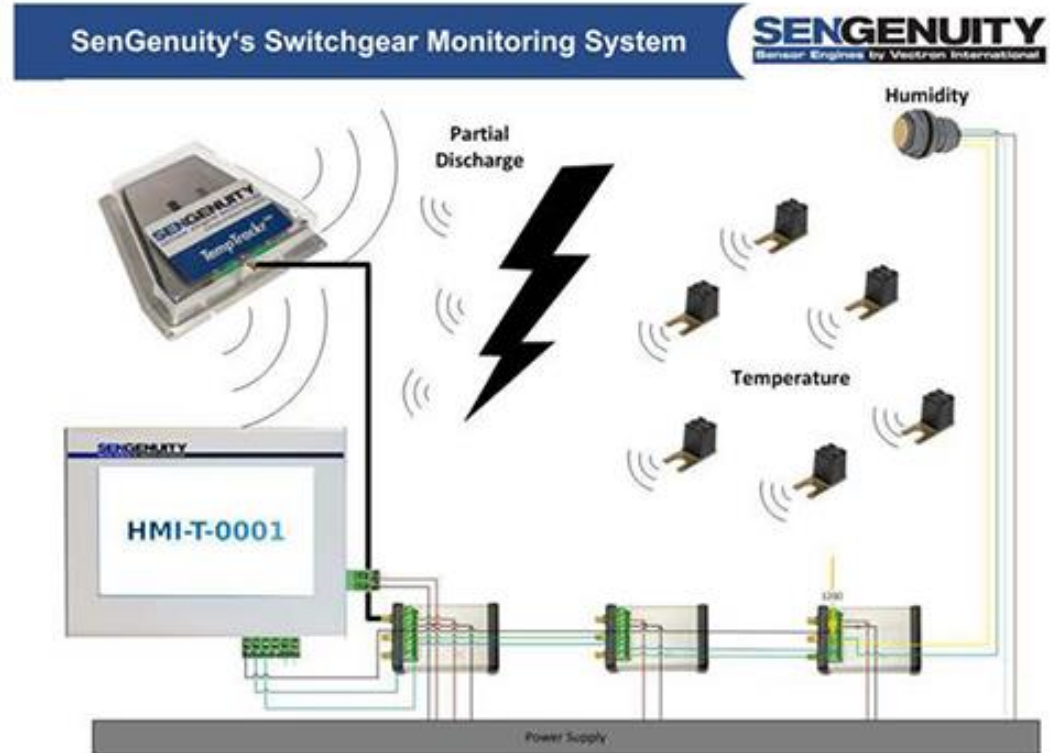
Controlled demonstration  
of a 4 kA arc fault



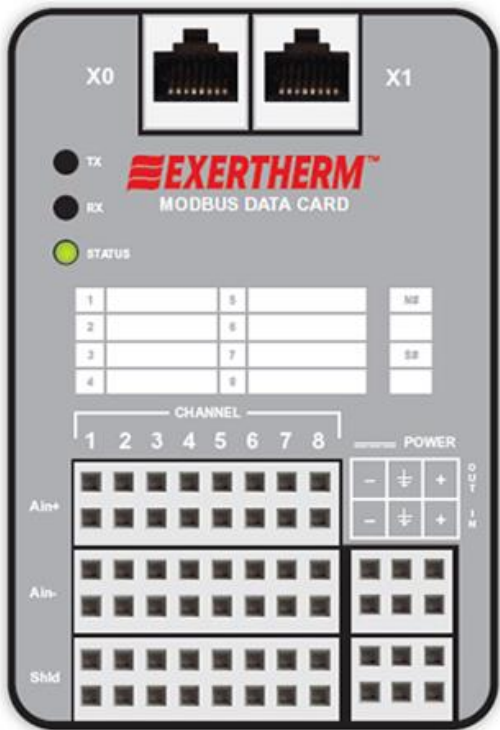
# SenGenuity

## Preventive Maintenance

- Senses sudden changes in temperature, humidity, and partial discharge
- Safety
- Cost Savings
- Shut down equipment when convenient



# Exertherm



# Student Skills and Takeaways for STEM Teachers

- Math is a must! But remember, you won't simply solve math problems everyday!
- Don't be afraid to try and fail
- You won't always know the answers, and that's ok
- ...but you must use resources to find the best solution
- You MUST work as a team
- You will learn what you need to learn, right when you need to learn it
- Be involved with your community
- Remember peoples' names
- Write thank-you notes (hand written!)

# ABB Florence Community Outreach

1. FSD1 Robotics Team (FRC Team 1758, The Technomancers)  
<http://www.frc1758.org/>
  - Donation
  - Support
2. Shadowing with a Florence employee
3. Donation to Distracted Driving Awareness Campaign in Florence. Safety first!



# ABB Florence Community Outreach

4. ABB is a bronze member of the Florence County Economic Development Partnership



**FLORENCE COUNTY**  
**ECONOMIC DEVELOPMENT PARTNERSHIP**  
*Global reach with a southern touch.*

# Questions?



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