



Smart Systems

Mohamed Shishani
Schneider Electric

**This session is eligible for
1 Contact Hour.**

For these hours to appear on your certificate, you must:

- Have your badge scanned at the door
- Attend 90% of this presentation
- Fill out the online evaluation for this session



NECA 2016 BOSTON

The Internet of Things

- Internet of Things connects devices, systems, software and people so that they can share information about their state and external environment...
- ... when well orchestrated, this can enable new capabilities and allows opportunities of improved efficiency, sustainability and safety.
- ... when applying the right business models, this unlocked value for our customers represents a growth opportunity for Schneider Electric

NECA 2016 BOSTON

Big Data and Internet of Things

The data center industry is undergoing a profound transformation to support the enormous data volumes and processing demands that are being generated

The world in 2020....

- 30B connected objects
- 4B connected people
- 3% of world power consumption
- 50T rillion GB of data
- 9Zettabytes of IP Traffic

Sources: Gartner, IDC, Uptime Institute, Cisco

NECA 2016 BOSTON

Megatrends Impacted by Smart Systems

POWER AVAILABILITY

Down time cost \$7,900 per minute for a data center

Source: datacenterknowledge.com

DIGITIZATION

50B connected things by 2020

Source: Cisco

ENERGY EFFICIENCY

+50% Energy consumption by 2050

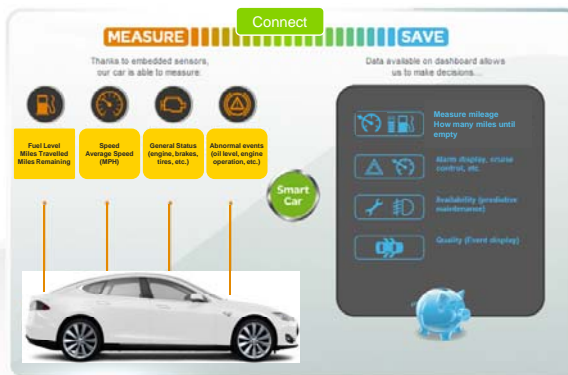
Source: IEA



NECA 2016 BOSTON

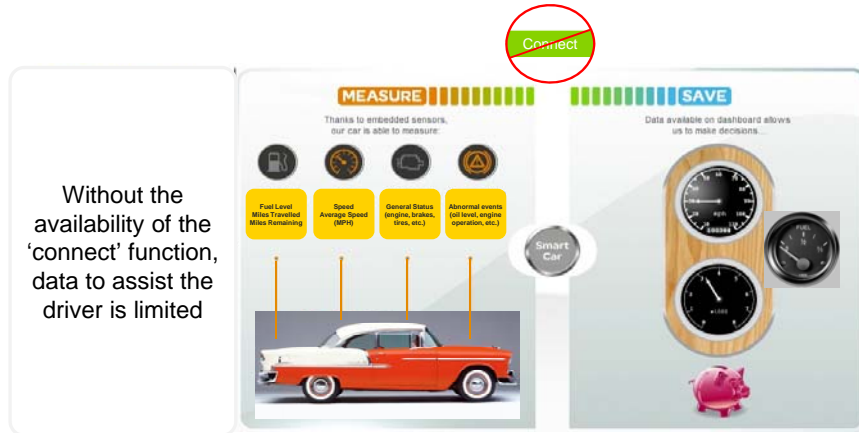
The "Smart" Automobile

Today - 'Smart' cars offers sustainable management, helping achieve fuel and cost savings, plus maintenance and alerts integrated into the car's design



NECA 2016 BOSTON

The "Smart" Automobile



Without the availability of the 'connect' function, data to assist the driver is limited



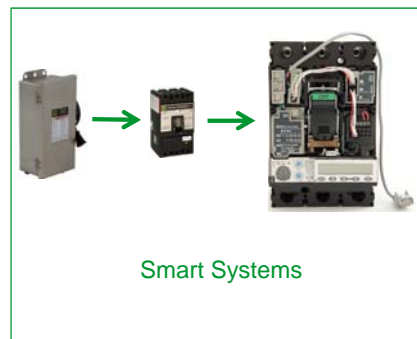
NECA 2016 BOSTON

Internet of Things

Everything is Connected




What does that mean to Schneider Electric?



NECA 2016 BOSTON


Why Smart Systems?

Know More Blind Spots with Smart Systems




NECA 2016 BOSTON

Communicating Equipment - Progression



**Square D
Without Coms**

- Square D Quality
- Manual process
- No Communication
- Sneaker Net



1990's


Serial Coms

- Micrologic Trip Units
- Modbus RS-485
- Traditional Strategy
- Legacy Technology
- Slow & Outdated

2000's - Now

Ethernet / Serial


- Modbus TCP/IP & RS485
- Ethernet Advantages
- Embedded Webpages
- Networked Data
- Software Compatibility
- Uses Standard Ethernet Infrastructure




New!

Direct Ethernet

- IP per Breaker
- Maximum data speed
- Modbus TCP/IP
- No Serial bottlenecks
- Advantage w/ Software
- Large / critical facilities
- Available PZ4 / QED6 / QED2



Smart Systems

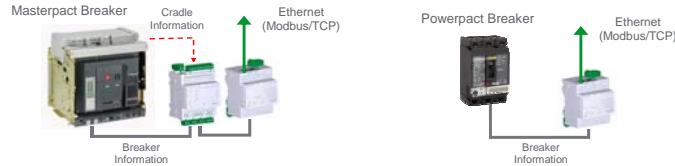


NECA 2016 BOSTON

Smart Systems in Switchgear & Switchboards (PZ4 / QED6 / QED2)

Wide Transparency

- Masterpact NT/NW breakers and PowerPact breakers with Micrologic can be monitored for status, metering, trending and more!



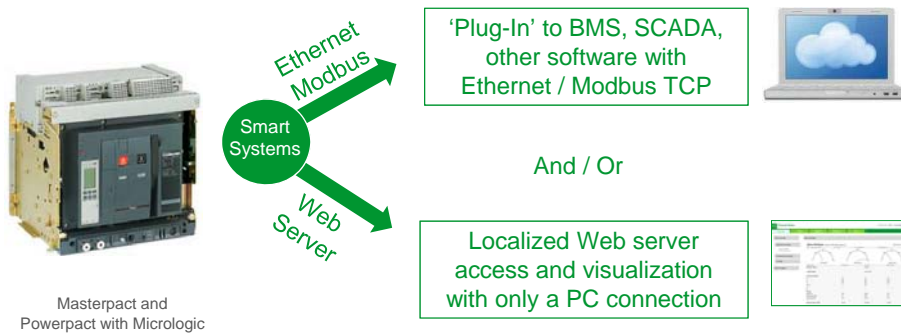
Tiered Communications Offer in Switchgear and Switchboards

- **Direct Ethernet** – Best Performance/Full Web Access
- up to 250 kbps to breakers (13x RTU) / Ethernet allows multiple devices to communicate simultaneously
- **Modbus RS485 to Ethernet** – Moderate Performance/Web Access
- Serial Modbus = 19.2 kbps - Number of devices significantly affects response time
- **Modbus RS485 Wired Out** – Serial Register Access Only



NECA 2016 BOSTON

Smart Systems Access to Breakers



NECA 2016 BOSTON


ERMS – Energy Reduction Maintenance Switch

2014 NEC 240.87 – Arc Energy Reduction for breakers 1200A or higher

- > “Energy reducing maintenance switching with local status indicator”

I/O Module - Enables ERMS

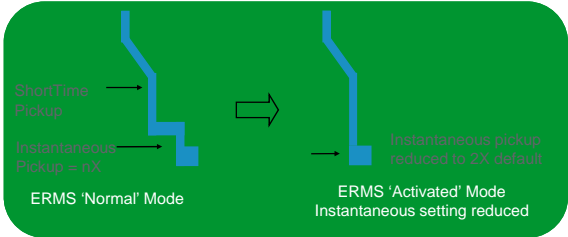
- > ERMS built-in as selectable function on I/O (Preset 3 on rotary switch)
- > I/O receives inputs from external On/Off switch
- > I/O output powers panel-mount indicator light – ULP handshake to confirm status
- > Micrologic trip unit displays 'ERMS' when activated
- > ERMS is compatible with ZSI




Note - ERMS Requires

- P/H Trip Unit
- Selector Switch
- I/O Module

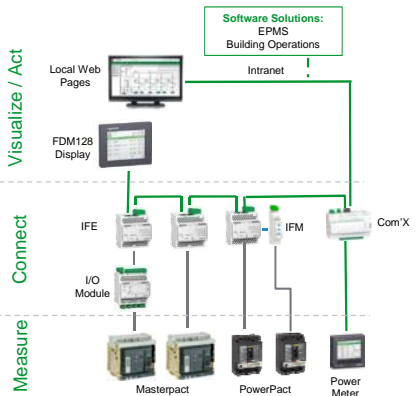
See document NHA67346
- ERMS Instruction Bulletin -





NECA 2016 BOSTON

Smart Systems Overview



Improved Ethernet Communication

- Cost effective local connectivity and visualization with IFE
- Better performance to SCADA, EPMS, BMS
- Expanded breaker control schemes

Asset Management Capabilities


- Event visibility
- Uptime priorities
- Convenience of notifications

Software Solution / Services Enabler

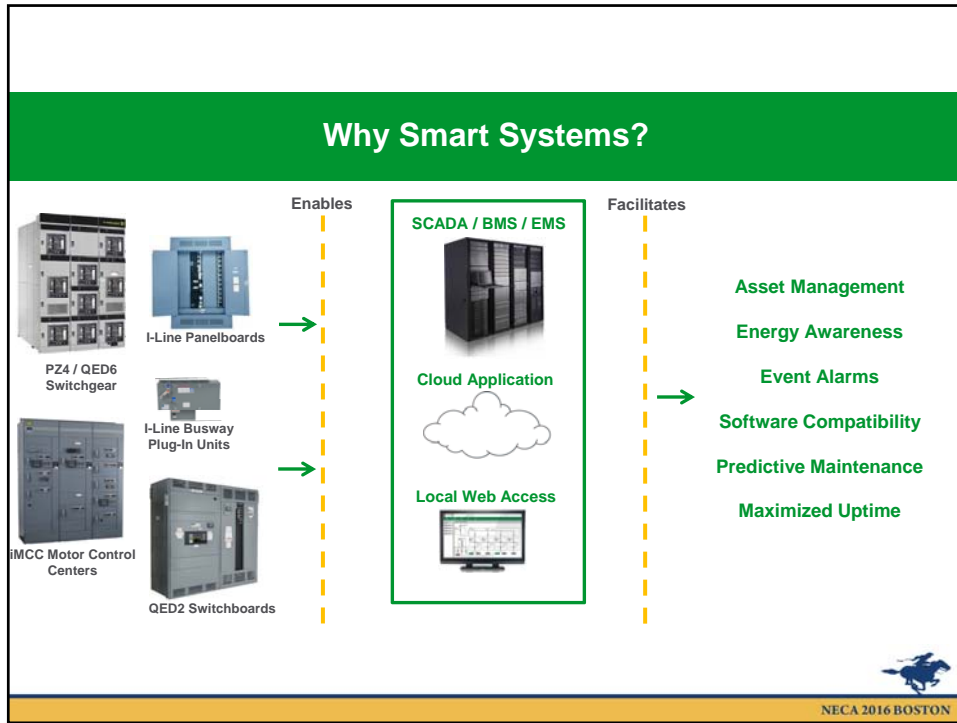
- Complete Solution message
- EPMS
- SBO + Power Manager

ERMS

- Energy Reduction Maintenance Setting
- Meet NEC 240.87 code

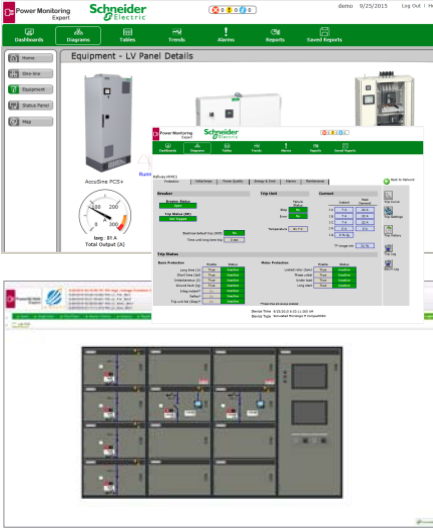



NECA 2016 BOSTON



Smart Systems w/ Software
The Message

**EPMS software is the “window”
to Smart Systems in Power
Critical Facilities**



Power Monitoring Expert
PowerSCADA Expert

NECA 2016 BOSTON

Questions?

*For More Information
Visit us in Booth 1017*



NECA
PREMIERPARTNER

NECA 2016 BOSTON

Appendix



NECA 2016 BOSTON

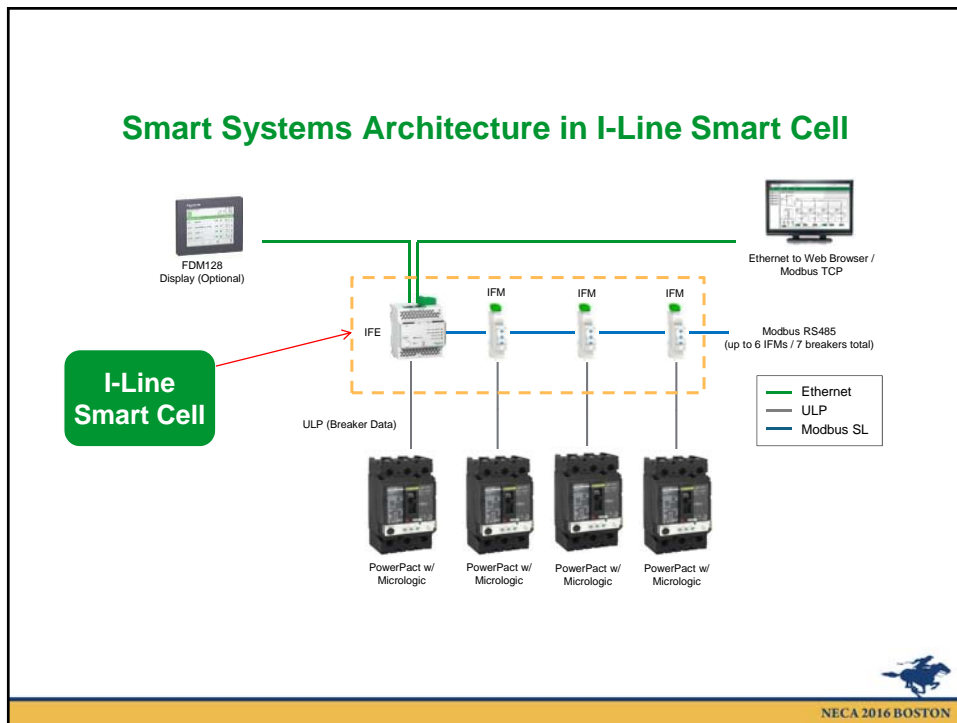
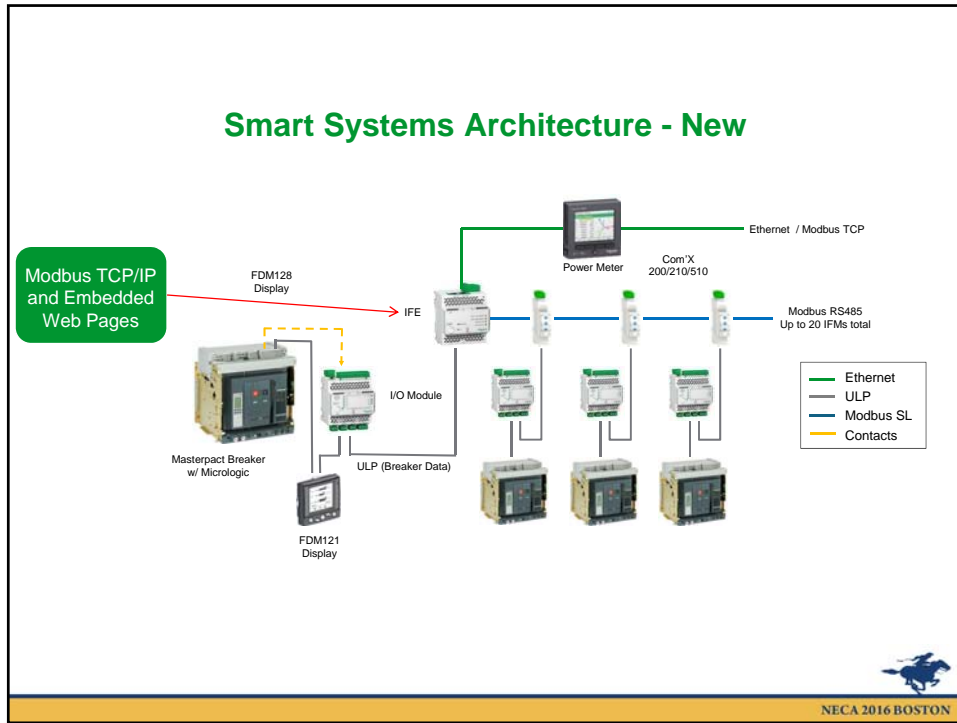
Integrating Smart Systems with Software: Value Propositions

Connectivity brings visibility

Category	Value	Feature	Benefit
Connectivity	Maximize uptime in large or critical applications	Direct Ethernet / IP per breaker	Delivers data at fastest available speed and allows full IFE capabilities for each breaker, reduces Modbus RS-485 serial dependence
	Remote access can save labor expense with instant data	Cloud Capabilities (with Com'X) for Data Anywhere and Remote services	Allows connectivity to Facility Insights and other cloud based applications for asset and energy optimization
Analytics	Efficient Energy & Asset Management to help OPEX	Embedded Web Pages	Able to display localized visualization of data, and supports e-mail alarming
Interoperability	Reduce commissioning and integration expense	Plug-In to BMS, SCADA or other software	Drivers exist for EPMS / SBO + Power Manager software packages
Regulatory and Safety	Maintain Code Compliance	ERMS – Energy Reduction Maintenance Setting	Improves fault clearing time over AMS
Power Controls & Reliability	Remote control - Save labor expense and energy use	Breaker Control from I/O module or BCM	Lets user control breakers locally (IFE, FDM128) or remotely with software



NECA 2016 BOSTON



Smart Systems in Low Voltage Drawout Switchgear (PZ4/QED6)

ERMS



- Energy Reduction Maintenance Switch
- Available on any Masterpact NT or NW Drawout Breaker with P or H Trip Unit (Not available on H, J or L)
- Superior to AMS solution – Faster
- Can be used with ZSI and other arc flash options

Plug and Play / RJ45 Cabling



- Inter wiring between devices via breaker networking cables reduces hardwiring and speeds commissioning and set-up
- Device auto-discovery



NECA 2016 BOSTON


What is 'Smart Systems'?

- Next Generation of Communication for LV Equipment empowering both local and enterprise level communications for ACB, MCCB, Power Meters and more!
- Enables LV equipment communication with Ethernet – Modbus TCP/IP
- Embedded Web pages for easy access to Status and Metering data
- 'Plug-In' Equipment to Schneider Electric software packages
- Enables ERMS for code compliance




NECA 2016 BOSTON

I-Line Smart Cell – Options



Ethernet Communications **EM3555/3560 Meter**


Serial Communications **ERMS – Energy Reduction Maintenance Setting**



NECA 2016 BOSTON


Smart Systems with Software: Features

Connectivity brings visibility






- Real-time metering/monitoring of electrical measurements across the entire range of LV equipment
- Visual indication of breaker and I/O status on electrical one-lines brings situational awareness
- Alarm/alert for abnormal operating conditions
- Granular energy metrics to drive operational & process efficiencies
- Analytics modules for asset management e.g. breaker performance module w/ breaker aging
- Prepare for the deluge of analytics in the future, by connecting your equipment now!

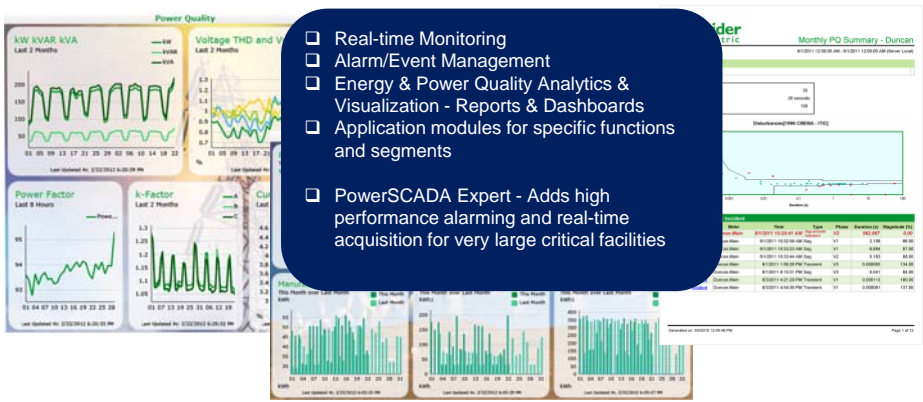
WE HAVE A WINNER




NECA 2016 BOSTON

EPMS Software   

StruxureWare™ Power Monitoring Expert & PowerSCADA Expert



- ❑ Real-time Monitoring
- ❑ Alarm/Event Management
- ❑ Energy & Power Quality Analytics & Visualization - Reports & Dashboards
- ❑ Application modules for specific functions and segments
- ❑ PowerSCADA Expert - Adds high performance alarming and real-time acquisition for very large critical facilities



NECA 2016 BOSTON