Smart Panels
Energy management has never been simpler

Presented by: Enrique Pastor and Faiz Ahmed
Power To The Cloud 2016
17th and 18th April 2016
Megatrends are provoking a rise in energy demand

Urbanization
+2.5B people in cities by 2050
Source: United Nations, DESA

Digitalization
50B connected things by 2020
Source: Cisco

Industrialization
+50% energy consumption by 2050
Source: IEA
Energy performance building directive

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 50</td>
<td>High energy performance BACS and TBM</td>
</tr>
<tr>
<td>51 to 90</td>
<td>Advanced BACS and TBM</td>
</tr>
<tr>
<td>91 to 150</td>
<td>Standard BACS (used as reference)</td>
</tr>
<tr>
<td>151 to 230</td>
<td>Non-energy efficient BACS</td>
</tr>
</tbody>
</table>

Simple requirement of the norms:

- Monitor energy consumption
- Identify sources of energy wastage
- ISO 9001 – ‘Quality’ Management System
- ISO 50001 - ‘Energy’ Management System
- Estidama ‘Pearl Rating’ system (LEED, RE-R2 guidelines)
Energy and operational efficiency concerns everyone

- **Building investors**
  - Green and energy efficient building
  - = Higher value for investment

- **Business owners** (Tenants)
  - Maximum uptime and high operational efficiency
  - = Maximum profits and occupant comfort

- **Facility management** (On call/on-site)
  - Quick notification and access to details of energy consumption
  - = Minimize expenses and offer high-quality service
In order to meet these expectations ...

**Specifiers**
- Must have access to **latest and scalable technological solutions**
- Must use **trusted and complete system architectures**
- Must demonstrate **compliance with the appropriate standards**

**Panel builders**
- Must be able to **choose simple solutions to respond to specifications**
- Must be able to make the installation in a **simple and plug-and-play manner**
- Must give **clear proof of readiness** to the contractor for commissioning

**Contractors**
- Must be able to **quote efficiently and with strong differentiation**
- Must have a system that is **simple to integrate and commission**
- Should be able to provide comprehensive **maintenance services** for the site
What are the traditional solutions?

During construction

- **Specifiers**
  - Prescribe generic solutions for energy efficiency and standard compliance
    - Low differentiation

- **Panel builders**
  - End up with simple panels with multiple additional sensors and I/Os
    - Cabling nightmare
    - Only manual reports for showing conformity to specs

- **Contractors and integrators**
  - Eventually have to deal with the errors and difficulties in integration of the different systems

During operation

- **Business owners/tenants**
  - Don't have transparency of data about the site performance
  - End up paying unnecessary penalties due to lack of predictive actions

- **Facility managers**
  - No auto-notifications of issues
  - Often have to travel to the site to diagnose simple problems
  - Cannot find historical maintenance information easily

> Loss of time and money

Life Is On
The solution is simple … start with Smart Panels based systems

Energy

- View of Energy & all other electrical parameters
- Basic Historical energy consumption analysis
- Simple energy dashboards

Operation and maintenance

- Real-time monitoring and control
- Instant notifications and continuity of service
- Easy management of all maintenance information

Ready to plug in to building and energy management software…..
3 simple steps to meet the objective

1. Measure
Capture all data with best-in-class embedded and stand-alone measurement

2. Connect
Most comprehensive range of devices for digitizing the complete architecture

Enerlin’X

3. Save
Flexible and affordable solutions based on building requirements
1. Measure

Capture all data with best-in-class embedded and stand-alone measurement

- **Breakers with embedded metering**: Shortest distance to collect data of all the electrical parameters, ready to connect to standard communication protocols.

- **Power meters**: Compact, high-performance meters for cost and network management applications on feeders and critical loads.

- **Energy meters**: Feature-rich, reliable energy meters with native protocol support to any BMS, AMR, or EMS system.
2. Connect

Most comprehensive range of devices for digitizing the complete architecture

- Smart displays
- Web browser interface (dashboards, graphs, history, diagnostics)
- Cloud-based apps and SW (e.g., Facility Hero)
- Light and room control systems
- Advanced software
  - Power monitoring expert
  - SmartStruxure™ building Op
- Third-party software

Ethernet interface for the Compact™ and Masterpact™ ranges

Ethernet interface for the Acti 9™ range

Data on local area network or to remote servers
3. Save

Flexible and affordable solutions based on building requirements

- **Small- to mid-sized buildings**
  - Simple energy and maintenance management
  - Local display, embedded web pages, and Facility Hero

- **Small- to mid-sized buildings**
  - Simple energy, lighting, and room control
  - Embedded software in spaceLYnk or SmartStruxure lite

- **Large premium buildings**
  - Advanced building and energy management system
  - SmartStruxure building operation or power monitoring/SCADA expert
Primary customer requirements
- Energy consumption per apartment (water, gas, electricity)
- Simple dashboard reachable anywhere
- Outage automatic notification (water, gas, electricity)

Key drivers for the solution
- One system manageable by electrical contractor
- Autonomy of the customer

Solution offered
- Com’X as site energy manager (60 energy meters)
- Smart Panels at main switchboard (IFE + I/O for pulse counters + power meters per zone feeders)
- Smart Panels at distribution board (Smartlink IP for outage notification and local meters)
3. Save

Simple and affordable energy and building control adapted to small- and mid-sized buildings

Examples of added advantages with Smart Panels

- Improve your energy awareness
  - Monitor instant load (kW)
  - Identify trends (last day/week/month)

- Avoid asset loss, improve maintenance
  - Alarms and event logs in case of fault
  - Email or SMS notifications

- Improve your OPEX
  - Schedulers for lighting
  - Save energy

Simple energy and maintenance management

Simple energy, lighting, and room control

Advanced building and energy management system

Typical examples:
- Offices
- Hotels
- Schools
3. Save

Advanced integrated software for comprehensive energy and building management

**Benefits of power manager**

**Ensure electrical network health**
- Monitor electrical equipment and key assets
- Improve response to power related issues

**Increase power quality awareness**
- Power factor, harmonics, and voltage
- Detect faults and diagnose key electrical problems

**Improve energy usage accountability**
- Track energy consumption and allocate costs
- Achieve energy conservation objectives

**Benefits of smart panels**

**Easy to install**
- Less cables
- Pre-engineered system

**Easy to commission**
- Direct IP connectivity
- TVD solution

**Deeper visibility into infrastructure**
- Feeder monitoring
- Breaker maintenance and testing

**Typical examples:**
- Hospitals
- Data centers
- Large shopping malls

*StruxureWare™ building operation with power manager*
How partners benefit from this solution

End Users, Consultants, Panel builders, Contractors
End users

Building investors

Business owners (Tenants)

Facility management (On call/on-site)

With flexible and affordable Smart-Panel-based solutions

- Higher value for investment
- Maximum profits and occupant comfort
- Minimize expenses and offer high-quality service
Two simple reference architectures

**On-site** real time monitoring and control

**On-line** Energy Management services
The new **Enerlin’X** range is the key for advanced connectivity

**Application:**
- Energy & Assets monitoring and control

**Characteristics:**
- Simple plug & play system
- Real time or on-line architecture
- Ethernet connected switchboard
- Web services
Smart Panel concept can be applied from upstream Main Low Voltage Panels up to downstream Final Distribution Boards.
Demo Low Voltage Network
Enerlin’X IFE

Application:
- Ethernet communication interface for LV breakers
- Embedded Web pages for energy monitoring & control
- Master for Modbus Serial Line port

Characteristics:
- Auto discovery of Modbus SL devices
- Capability of sending alarms over e-mails

* Simple web pages that can display energy as well as asset information as easy as using an internet browser
Stay connected to your site thanks to email alarms for any major event
Enerlin’X IO

Application:

- Predefined applications including cradle management
- 12 user-defined applications for following categories:
  - Protection functions
  - Control functions
  - Energy monitoring functions
  - Monitoring functions

Characteristics:

- Wide variety of applications for LV breakers

* Get complimentary information about the breaker's environment thanks to easy to set up applications through the IO interface
Enerlin’X IFE + IFM

Application:
• Ethernet communication interface for LV breakers
• Embedded Web pages for energy monitoring & control
• Master for Modbus Serial Line port

Characteristics:
• Auto discovery of Modbus SL devices
• Capability of sending alarms over e-mails

* Simple web pages that can display energy as well as asset information as easy as using an internet browser
Stay connected to your site thanks to email alarms for any major event
Enerlin’X Smartlink IP

Application:
• Monitoring & control of Final distribution switchboards
• Energy metering
• Direct Ethernet interface

Characteristics:
• Prefabricated cables for Acti9 offer
• Installation between din rails

Reflex iC60
• Remote Management of Loads – Remote opening / closing (lighting control)

RCA – Remote Control Auxiliary
• MCB remote opening / closing (lighting control)

ARA – Automatic Reclosure Auxiliary
• Continuity of Service in Remote sites

* The Smartlink IP is the first devices of its kind for direct ethernet connectivity & control for the FD switchboard
Enerlin’X FDM128

Application:
• Monitoring & control of up to 8 LV breakers
• Embedded ready-to-use features
• Digital & graphical view of the electrical parameters & breaker status

Characteristics:
• Auto discovery of Modbus SL devices
• Simple installation, only Ø22mm hole on front face

* Very comprehensive and easy to understand view of the complete Switchboard
Very easy to navigate with the user friendly colored touch screen interface
Enerlin’X Com’X

Application:
• Data logger: Data transmission as a report on the internet database server

Characteristics:
• Simple to install & configure
• Data delivery and device management (remote service platform)
• Large embedded connectivity (Ethernet, Modbus, GPRS, Digital & Analog I/Os)

* The GPRS feature of the Com’X gives tremendous advantage to the customer to avoid using his existing network for pushing data to the cloud.
In built security for high level of protection of the transmitted information.
Altivar Process
Variable Frequency Drives

Features:

• Services oriented Drive (EM, Assets, System performance)
• Process applications – Fluid & gas handling; Solid movement and mechanics
• Pump Curves embedded, Define best efficiency point
• Energy Savings – Measurements, Low Harmonics
• QR code – Info on assets
• Connected from anywhere
• Personalized dashboard
• Proven technical solutions for Projects
• Wide range: 0.75kW to 1500kW (up to 690V)

* A new concept, the Altivar Process focuses on major industry process and End user focus on full life cycle management.
Altivar Process VFDs

Pump curves embedded
- Easy to set
- Downloadable in open standard format

Pump monitoring
- Operation point
- Position vs Best Efficiency Point
- Pump efficiency assessment

* A new concept, the Altivar Process focuses on major industry process and End user focus on full life cycle management.
Altivar Process helps....Optimize your business
By giving information on assets

**Dynamic QR Code**

- Direct and comprehensive information

and minimize downtime
Get connected wherever you are
Get connected wherever you are
Get connected wherever you are
Power Monitoring Expert Software

Features:

- Data acquisition & system integration (Meters, Breakers, Relays, WAGES)
- Real time monitoring (Dashboard, Real-time Energy, Trends, data logs, Alarms,)
- Power quality analysis (N/w monitoring, Harmonics, THD, Waveform capture, Plot sags, swells, transients, time-stamped events)
- Trend graphing (single or multiple graphs, Trend measurement for any parameter – V, I, P, PF, KWH..)
- Control (Supervisory equipment control, Manual and Automated control)
- Alarming, event logging , Custom reports – Email, SMS
- Monitoring & control of Final distribution switchboards
- Direct Ethernet interface, Scalable

* A complete supervisory software interface for energy efficiency, power availability and asset management applications
PME – Data acquisition & System integration

- Combined metering of all utilities (WAGES)
  - Water, compressed Air, Gas, Electricity, Steam
- Monitor your entire distribution system, including:
  - PowerLogic meters, circuit breakers, protection relays
- Interface with third-party meters, transducers, PLCs, RTUs, power distribution or mitigation equipment
  - Quickly add/configure Modbus RTU/TCP communications using templates
  - Connect transducers or other devices to the digital/analog inputs of PowerLogic meters
- Integrate with other systems
  - Energy management, SCADA, BAC, DCS, ERP
  - Use ODBC, XML, OPC, FTP, CSV, PQDIF, web services

* A complete supervisory software interface for energy efficiency, power availability and asset management applications
Ecoreach Experience

Project Lifecycle

Facility Managers
Software to track installation changes & diagnostic features for Preventive Maintenance

Electrical Contractors & System Integrators
Shorten commissioning time and speed up SAT delivery with an easy-to-use Software

Panel Builders
Simple & Easy Software to setup and test a Panelboard with Smart Devices

One tool supporting 500+ products variants

Schneider Services

Life Is On
Smart Panels!

- Monitor & control energy consumed
- Reduce cost per kWh
- Reduce CO2 footprints
- Reduce operating expenditures
- Realize measurable efficiency
THANK YOU.