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Echelon Profile

- Founded 1988
- 10 offices worldwide
- Experienced management tea and board of directors
  - Includes founders of ROLM, Apple Computer, StrataCom
- Strong, focused patent portfolio
  - Over 100 patents issued/pending; nearly 40 related to power line communications
- 80 million Network transceivers shipped
- 35 million PLC transceivers shipped
- >25 million Smart meters shipped

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Agenda

- HAN Challenges
- NES System HAN Solutions
- Case Study
- Q&A

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Smart Meters Need to Support Multiple HAN Technologies

- One HAN technology cannot support all in-home devices and applications for all customers due to interference, distances, etc.
- Also, since communication technologies continue to evolve, the system needs to be able to incorporate new HAN technologies in the future.
- Therefore, Echelon believes that it is important for smart meters to support multiple HAN technologies.
  - The NES system is designed to support both an 802.15.4 radio and power line communications, as well as other HAN technologies as required.
  - NES Smart Meters provide an optional Multipurpose Expansion Port (MEP) that provides connections to a variety of HAN comms cards based on open standard protocols to enable interoperability with in-home devices such as in-home displays.

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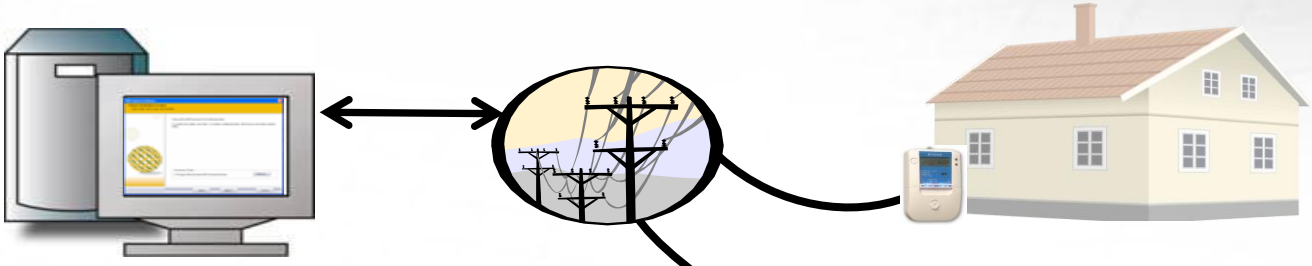
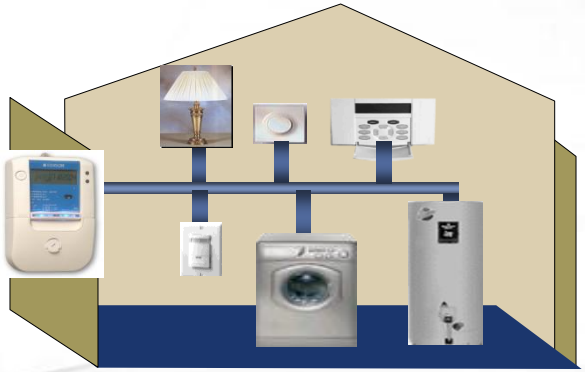
Extending Into the Home





- Power lines are the ideal connection into the home
  - More reliable and economical than RF
  - EN 14908 open standard
  - 1,000+ LonMark Certified products
  - Secure authenticated and encrypted data exchange
- PLC in Meter reaches every home outlet and switch
- PLC is not blocked by or interfered with existing 2.4GHz home networks
- PLC is not subject to RF multi-path fading in fixed point communication
- PLC can be used to bridge to home gateway and RF devices inside the home
- The NES network provides a low-cost, universal, bi-directional communications

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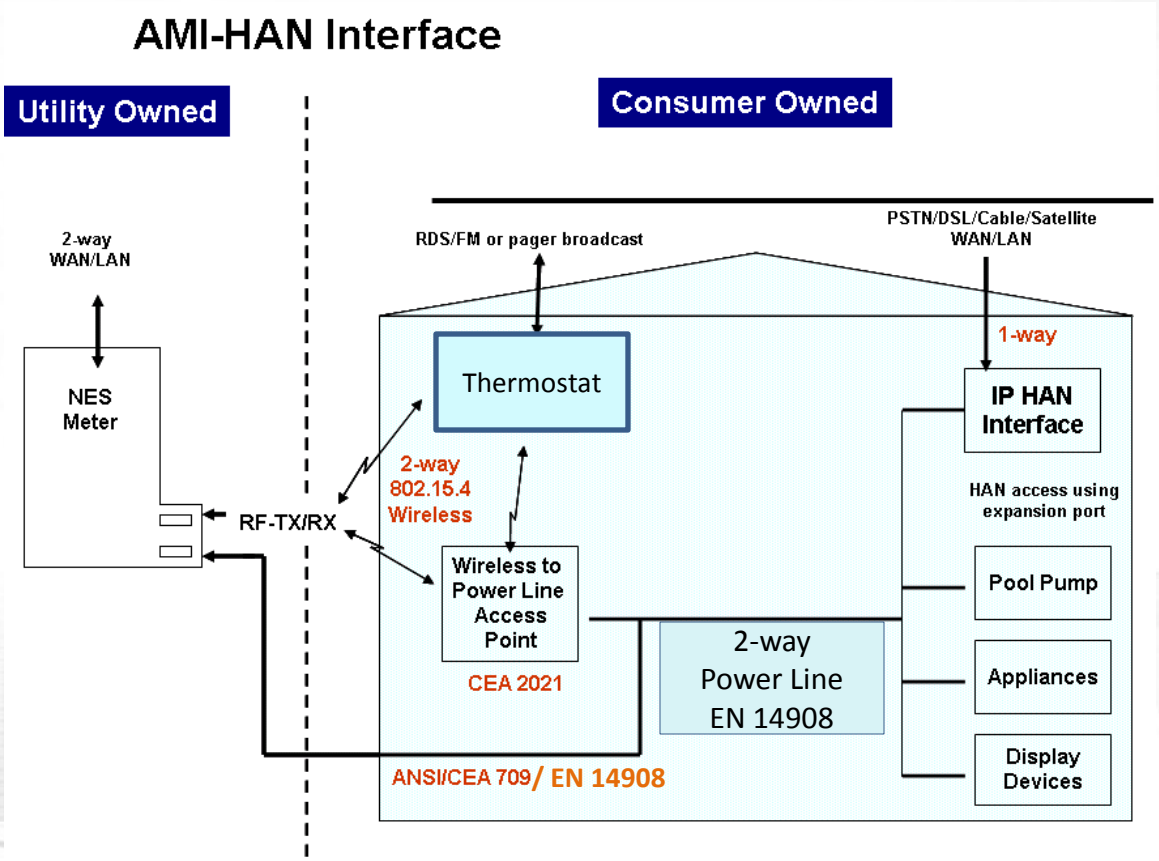
Multiple HAN Technologies



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NES: Beyond AMR

- NES is a platform for utility applications
  - **Open**
    - Based on open, internationally recognized standards
      - EN 14908, SOAP/XML, TCP/IP, M-Bus, etc.
  - **Bi-directional**
    - Each metering point is a fully accessible network node
  - **Extensible**
    - Supports remote functionality upgrades
    - Natively supports the popular pulse and M-Bus standards
    - Designed to grow to carry value added services over the same infrastructure
      - Consumer applications (C-band)
        - In-home display, prepayment, appliance monitoring and control, etc.
      - Commercial applications (A-band)
        - Vending machine monitoring and control
        - Street lighting (A or C)

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Case Study 1

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1 – Energy Management Displays

- Making energy visible
- Providing people with a means to cut carbon emissions

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1 – Energy Management Displays

- Appliances
  - Heating & hot water usage
  - Multiple individual appliances with consumption in terms of energy cost and CO_2 emissions
  - Remote control of individual appliances with safety and security lock options

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Case Study

Voltalis

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2 – Residential Demand-Response

- *BluePod*
  - PL3120 Design
  - MomBox2 : Control Box with Linux with GSM/GPRS
- 25,000 installed

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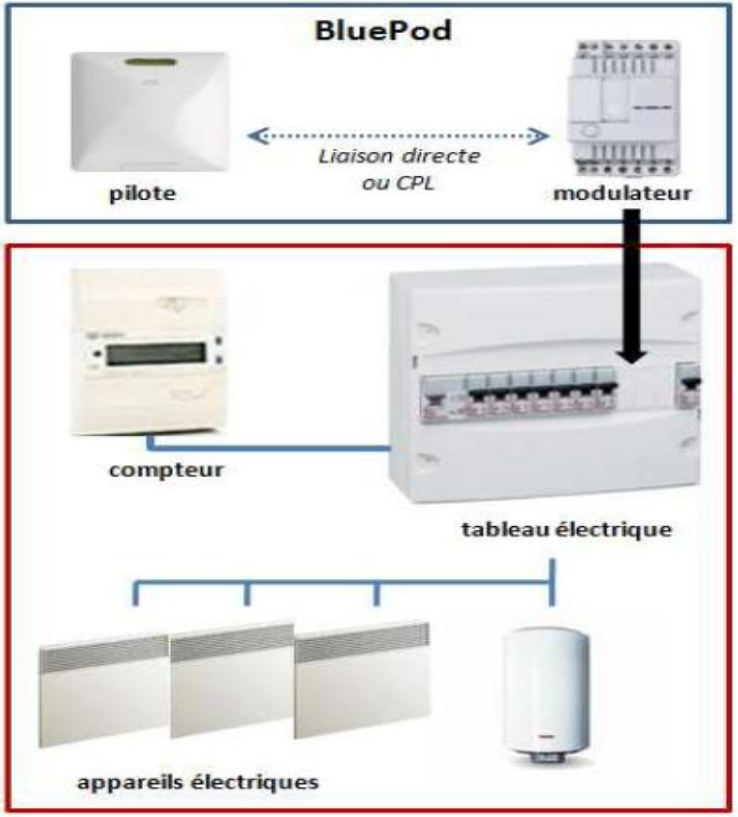
2 – Residential Demand-Response



- The pilot MomBox2
  - Linux operated Box controlling *modulateurs* through powerline
  - Connected via GSM/GPRS with a central service center.
  - ShortStack based
- The energy demand controller *modulateur*
  - Five channels: each one is measured and controlled (ON/OFF).

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Bluepod

Intelligent and communicating system
For measurement and command
Installed in customers' premises

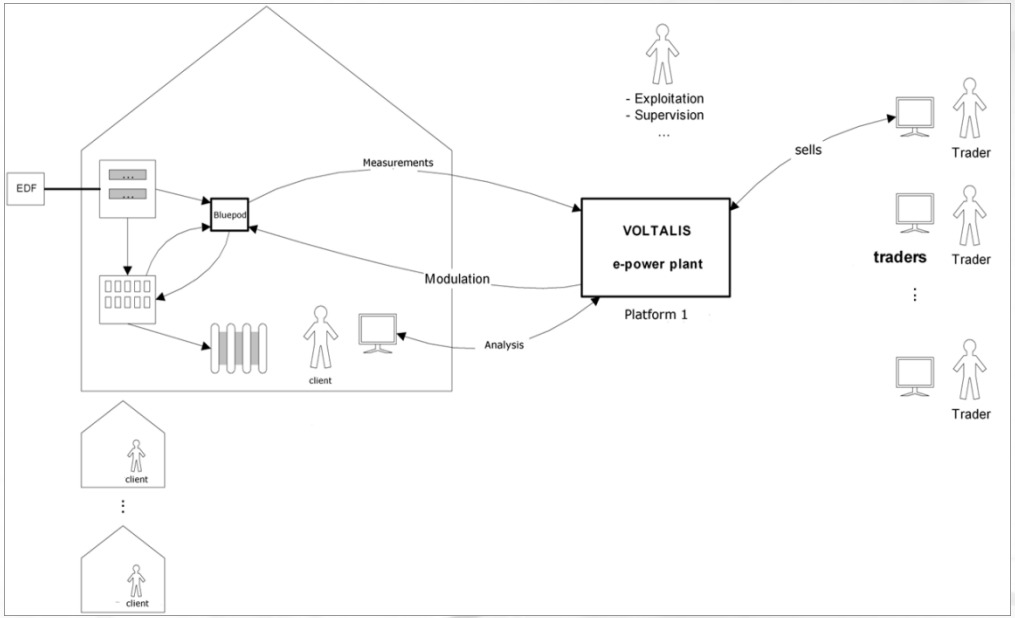
Components

Modulator: electrical part

Acquisition of total consumption from global meter
Measurement and command: multi-channels connected to electrical appliances

Pilot: communication & intelligence

Communicates with the *e-Power Park* platform
Autonomous



E-Power Plant : a package of services

Clients (myVoltalis)
Monitoring of electrical consumption (total & for each appliance)
Energy and carbon dioxide saved
Voltalis
Supervision
Exploitation and trading

Q&A

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