

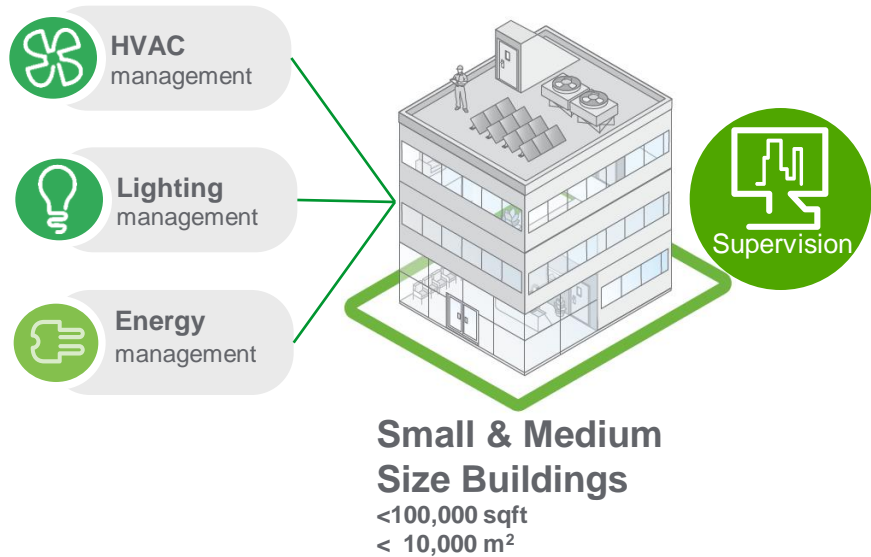
# SmartStruxure™ solution for Small Buildings

Exchange 2012  
**Connect**

**Schneider**  
Electric

# Introducing: SmartStruxure™ Solutions for Small Buildings

## Innovative Control Solutions for Small & Medium size building



### Offer values

**Simplified Automation**

**Open Systems**

**Facilitate Retrofit**

### Benefits

**Lower Total Installed Cost**

**Increase Energy Savings with Improved Comfort**

**Improve customer ROI**

# Product Ecosystem

Q1 2013

Managers

Site Manager / Gateway



Aggregator with I/O's



Controllers

Input /Output



VAV



SE7000- Room Controller



Available Now

End Device



CANopen

# Value proposition

## Reduce your costs and get more jobs

### Become a leader in a huge underserviced market

- > Traditional BAS do not scale well for 98% of commercial buildings
- > **Less than 10%** of light-commercial and mid-market buildings have a BAS
- > The fixed costs of gateways, servers and software are too high
- > The Smart Struxure Web BEMS has no license fee
- > The Smart Struxure controllers do not need gateways

### Get privileged access to jobs where wiring is difficult, costly or inconvenient

- > The wireless capabilities of Struxure controllers reduce wiring and conduit work
- > Save up to **60%** on electrical labor costs
- > Less downtime & inconvenience for your clients
- > Stop opening walls and install during office hours

### Get the job done faster, get paid faster, do more jobs

- > Save up to **40%** time on the job with wireless
- > Add value to your services with faster retrofits

# The reality of the market

## Small & medium buildings

> Huge, underserved market

	Penetration rate of HVAC BAS	Penetration rate of Lighting BAS	No. of buildings	Surface
Small & medium buildings (100,000 sq.ft. or less)	5%	1%	98%	65%
Large buildings (over 100,000 sq.ft.)	43%	12%	2%	35%

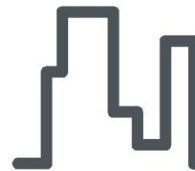
*Data about EMCS from the Energy Information Administration (EIA)*



Single and multi-site retail



Elementary Schools



Small offices



Motels and small hotels



Telecom cell sites & utility substations

# Realities of Building Automation

Why is the market underserved?

1) Heavy **fixed costs**

2) Lots of **wiring**

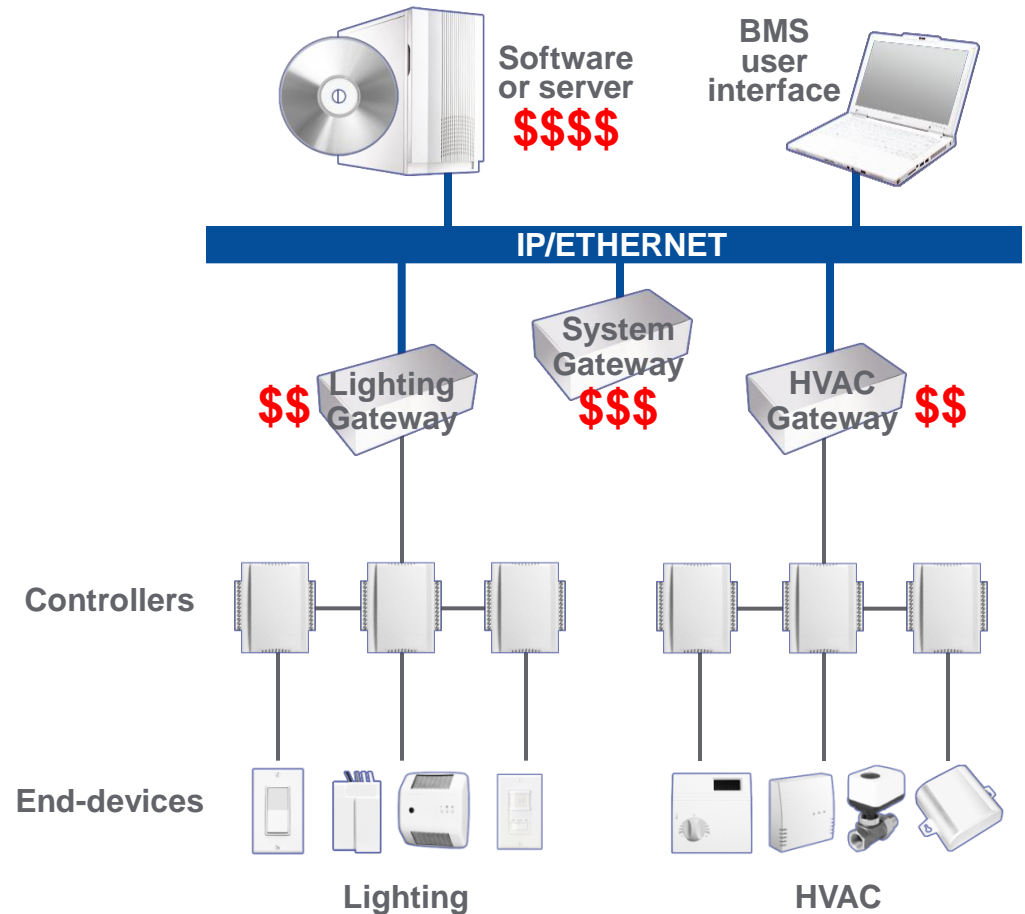
- > Takes **time**
- > Adds **labour & repair**
- > Adds **downtime**

As a result of these costs, the payback period is too long for the building owner/FM.



There is no retrofit project.

Typical BAS architecture



# Faster installation, integration & payback

## Smart Struxure architecture



IP/ETHERNET

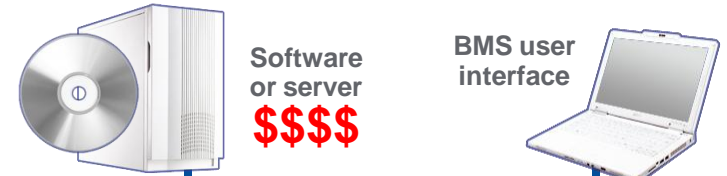
Web server & gateway functions reside directly inside the controller; reducing the fixed costs of projects.



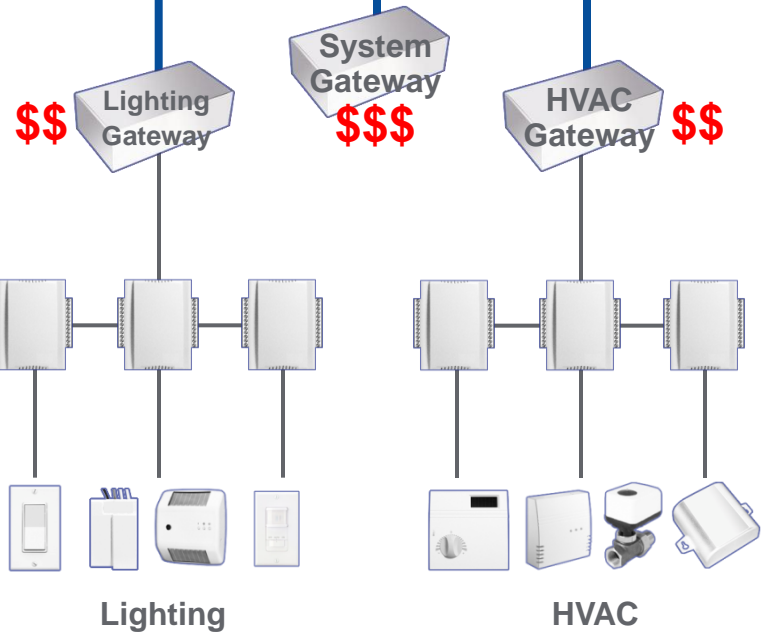
HVAC, Lighting, Metering, Access and other applications



## Typical BAS architecture



IP/ETHERNET



# Web BEMS (Building Energy Management System)

## Monitoring & Management

- > HVAC, Lighting, Occupancy, Metering
- > For projects of **25 controllers or less**

## Included with the hardware

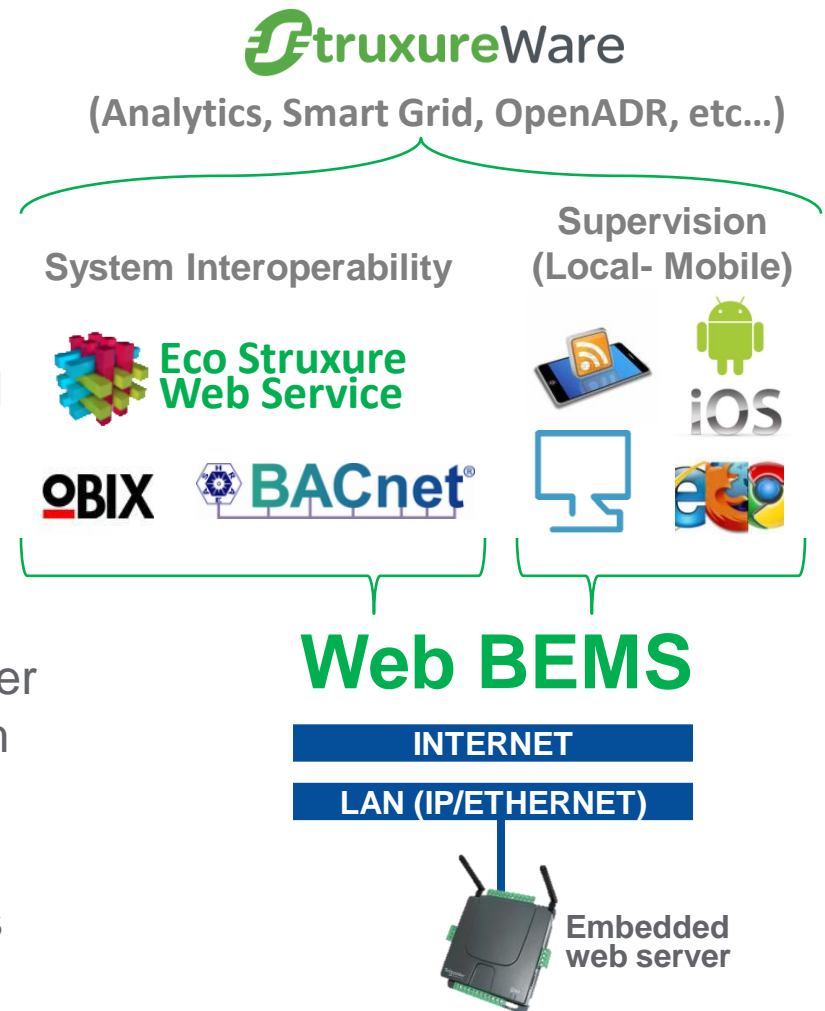
- > Hosted by the controllers
- > No dedicated server, no software to install
- > No license fees

## Access

- > Local access through the LAN
- > Remote access online using a web browser
- > Can sit under a third party BACnet system

## Cloud, EWS, oBIX, BACnet

- > Compatible with a wide variety of systems
- > Use one of these systems for projects requiring **more than 25 controllers**



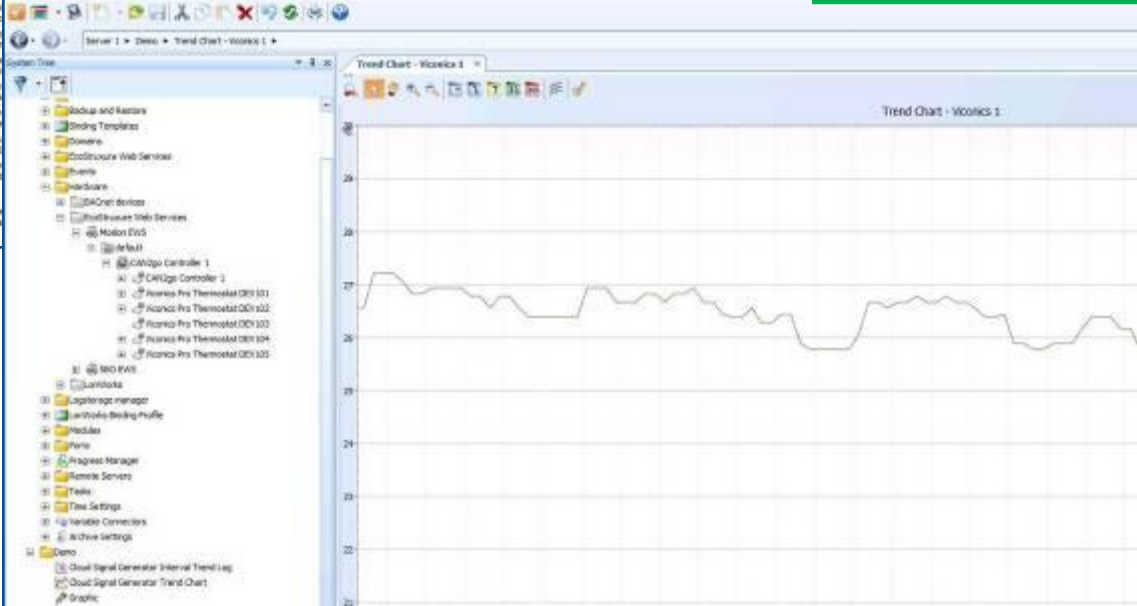
# Cloud Ready: StruxureWare

The screenshot displays the StruxureWare Management software interface. On the left, the 'System Tree' shows a hierarchical view of the system components, including 'Hardware', 'EcoStruxure Web Services', and 'Molten EVS'. The main window shows a list of parameters for 'Vocico Pro Thermostat DEV001'. The parameters include:

Name	Description
ControlSequenceOfOperation	Specifies the overall operating environment. 0x00 Cooling Only, 0x01 Cooling with Reheat, 0x02 Heating Only, 0x03 Heating with Reheat, 0x04 Cooling and Heatin...
ExtendedID	00000103292
HumidityMeasureValue	
KeyMABidout	Specifies level of functionality that is available to the user via the keypad. 0x00 No lockout, 0x01 Level 1 lockout, 0x02 Level 2 lockout, 0x03 Level 3 lockout, 0x04 Level 4 lockout, 0x05 Level 5...
LocalTemperature	Displays the Room Temperature in degrees Celsius and is measured locally or over the network. Temperature, min=+40 F(+4 C), max=+122 F(50 C)
MaxHeatSetpointLimit	States the maximum heating setpoint permitted. Temperature, min=+40 F(+4 C), max=+90 F(32 C)
MinCoolSetpointLimit	States the minimum cooling setpoint permitted. Temperature, min=-54 F(-5 C), max=+30 F(3 C)
ModeIdentifier	Specifies the mode lockout.
Occupancy	Displays the occupancy status. Occupied
OccupancyCommand	Specifies the occupancy command.
OccupiedCoolingSetpoint	Specifies the cooling setpoint.
OccupiedHeatingSetpoint	Specifies the heating setpoint.
PICoolingDemand	Specifies the cooling demand.
PIHeatingDemand	Specifies the heating demand.
SystemMode	Specifies the system mode. 0x00 Off, 0x01 On
TemperatureDisplayMode	Specifies the temperature display mode. 0x00 Celsius, 0x01 Fahrenheit
UnoccupiedCoolingSetpoint	Specifies the unoccupied cooling setpoint.
UnoccupiedHeatingSetpoint	Specifies the unoccupied heating setpoint.

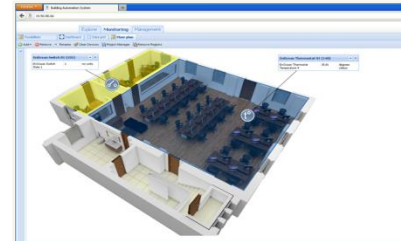
Objects Tree

Trending



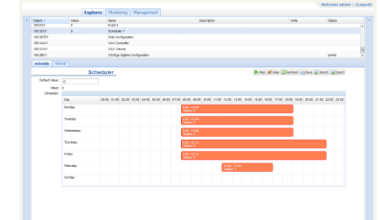
# Web BEMS is simplified automation

## Dashboards & Maps



## Pre-configured objects...

SE7000 & 3rd party + Scheduler, Events, Trend logs, PID loops, etc.

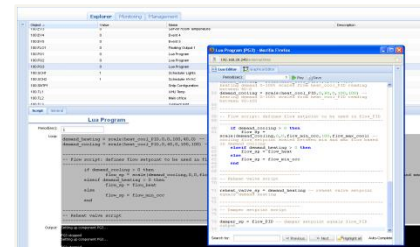
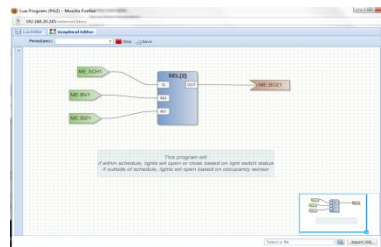


All in One Web BEMS



## Programming

Graphical programming, Scripting



# Web BEMS

## The Dashboard

A user-friendly way to display key metrics, trends and data. Perfect for the building owner, facility manager or occupant with limited building automation experience.



Track energy savings

Monitor consumption

- Electricity
- Gas
- Water
- And more...

Monitor systems and sensors

- Temperature
- Lighting
- Humidity
- Occupancy
- CO<sub>2</sub>
- And more...

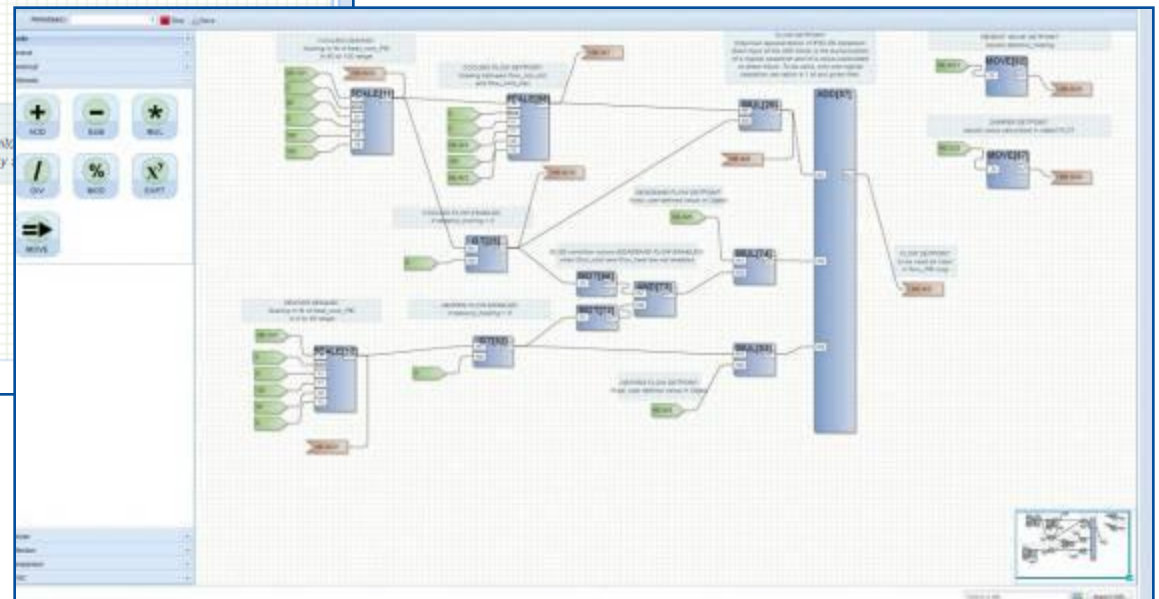
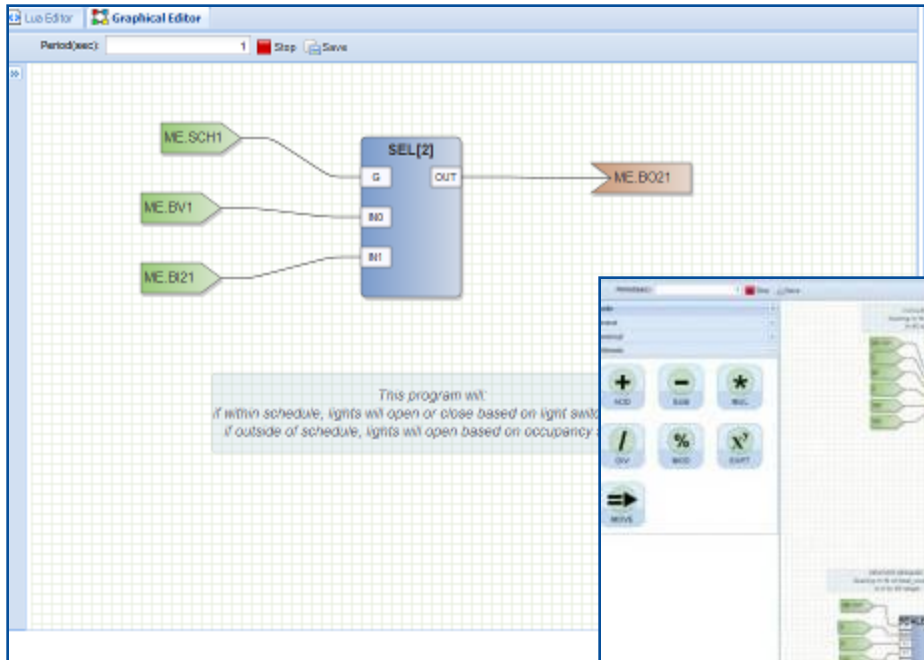
Compare ratios

View trends

# Web BEMS

## Graphical programming/Block programming

Drag and drop function blocks to create the desired control sequences. Good for basic and advanced applications.



# Web BEMS

## Scripting

You can also program your control sequences via scripting.

The screenshot shows the Schneider Electric Web BEMS interface. At the top, there are tabs for 'Explorer', 'Monitoring', and 'Management'. Below these is a table with columns for 'Object ID', 'Name', and 'Description'. The table lists various components such as '100.E-1', '100.E-4', '100.F-1', '100.F-2', '100.F-3', '100.F-4', '100.F-5', '100.F-6', '100.F-7', '100.F-8', '100.F-9', '100.F-10', '100.F-11', '100.F-12', '100.F-13', '100.F-14', '100.F-15', '100.F-16', '100.F-17', '100.F-18', '100.F-19', '100.F-20', '100.F-21', '100.F-22', '100.F-23', '100.F-24', '100.F-25', '100.F-26', '100.F-27', '100.F-28', '100.F-29', '100.F-30', '100.F-31', '100.F-32', '100.F-33', '100.F-34', '100.F-35', '100.F-36', '100.F-37', '100.F-38', '100.F-39', '100.F-40', '100.F-41', '100.F-42', '100.F-43', '100.F-44', '100.F-45', '100.F-46', '100.F-47', '100.F-48', '100.F-49', '100.F-50', '100.F-51', '100.F-52', '100.F-53', '100.F-54', '100.F-55', '100.F-56', '100.F-57', '100.F-58', '100.F-59', '100.F-60', '100.F-61', '100.F-62', '100.F-63', '100.F-64', '100.F-65', '100.F-66', '100.F-67', '100.F-68', '100.F-69', '100.F-70', '100.F-71', '100.F-72', '100.F-73', '100.F-74', '100.F-75', '100.F-76', '100.F-77', '100.F-78', '100.F-79', '100.F-80', '100.F-81', '100.F-82', '100.F-83', '100.F-84', '100.F-85', '100.F-86', '100.F-87', '100.F-88', '100.F-89', '100.F-90', '100.F-91', '100.F-92', '100.F-93', '100.F-94', '100.F-95', '100.F-96', '100.F-97', '100.F-98', '100.F-99', '100.F-100'. Below the table, there are buttons for 'Script' and 'Refresh'. The main area is titled 'Lua Program' and contains a code editor with the following Lua code:

```
1001 demand_heating = scale(best_cool_PID, 0, 0, 100, 0) --
1002 demand_cooling = scale(best_cool_PID, 0, 80, 0, 100)
-----
-- Flow script: defines flow setpoint to be used in FL
-----
60 if demand_heating > 0 then
61   flow_sp = scale(demand_heating, 0, 0, flow_max_cool)
62 elseif demand_heating > 0 then
63   flow_sp = flow_heat
64 else
65   flow_sp = flow_min_cool
66 end
-----
-- Reheat valve script
-----
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
```

The output console shows the following messages:

```
Output: Setting up component PCS
PCS stopped
Setting up component PCS
PCS stopped
```

All the power and flexibility of scripting For system integrators and facility managers who want to push their control sequences to the max, the Web BEMS has a scripting tool offering all the freedom necessary to push energy efficiency optimization to its limit.

The scripting tool includes real-time response to scripting.

# Web BEMS

## Configuration

Integrate and configure your objects using analog and binary variables. You can also use existing objects for multiple devices including the DA2 wireless damper/valve actuator, the TE2 wireless terminal equipment controller, the SE7000 applications specific controller/thermostat and several meters. Objects also exist for EnOcean devices such as thermostats, relays and switches.

The screenshot displays the Schneider Electric Web BEMS configuration interface. The main window is titled "Welcome admin - (Logout)" and features a navigation menu with "Explorer", "Monitoring", and "Management" tabs. The "Explorer" tab is active, showing a tree view of the network structure. The main content area is titled "EnOcean Thermostat" and displays the configuration for a specific thermostat object. The configuration includes a table of objects, a description field, and various input fields for Name, Node, Object ID, Manufacturer, Model, State, and Energy Box. The current temperature is shown as 22.59 degrees Celsius, and the setpoint is 26.95 degrees Celsius. The interface also includes a temperature slider and a "Switch" configuration section.

Object	Value	Name	Description	Units	Status
100A041	28.883	EnOcean Thermostat Setpoint 1		degrees celsius	
100A041	22.588	EnOcean Thermostat Temperature 1		degrees celsius	
100B061	0	EnOcean Thermostat State 1		no units	
100B061	0	EnOcean Thermostat Press 1		no units	
100E041		EnOcean Thermostat 1			

EnOcean Thermostat configuration fields:

- Name: Thermostat
- Node: A6903256
- Object ID: 35447
- Manufacturer: 0
- Model: 0
- State: 0
- Energy Box: 0

Current Temperature: 22.59 (Degrees Celsius)

Setpoint: 26.95 (Degrees Celsius)

Switch configuration section:

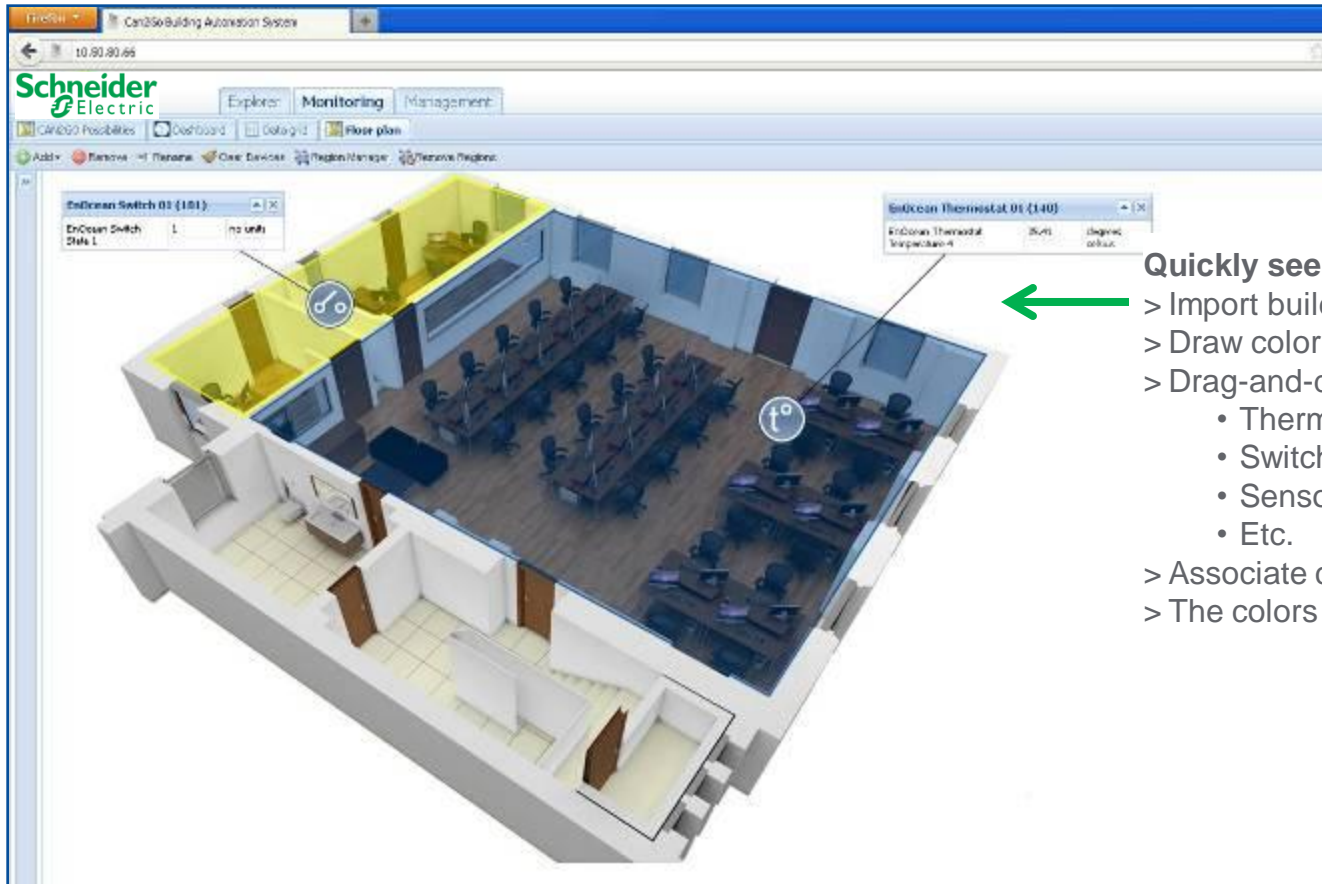
- Switch State 1: no units
- Switch Press 1: no units
- Switch 1: [Switch icon]

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# Web BEMS

## Maps

Import maps of your buildings, draw zones and see system status within those zones.



### Quickly see how your building is doing

- > Import building, floor and zone maps.
- > Draw color-coded zones.
- > Drag-and-drop your objects onto the maps.
  - Thermostats
  - Switches
  - Sensors
  - Etc.
- > Associate colors to events.
- > The colors will tell you if you're in the green.

# Web BEMS

## Schedules

Use schedules to regulate your HVAC and lighting systems according to building use. You can create schedules for each zone according to opening and closing hours, or any other time-based event.

The screenshot shows the Schneider Electric Web BEMS interface. At the top, there's a navigation bar with 'Explorer', 'Monitoring', and 'Management' tabs. Below this is a table listing various objects and their values. The 'Scheduler' tab is selected, showing a configuration for 'Scheduler 1'. The interface includes a 'Default Value' field set to 0, a 'Value' field set to 0, and a 'Scheduler' section with a grid. The grid has columns for hours from 00:00 to 23:00 and rows for days of the week. Orange bars indicate active periods: Monday-Friday from 8:00 to 19:00, Thursday-Friday from 8:00 to 22:15, and Saturday from 12:00 to 17:00. A green arrow points to the Saturday bar. At the bottom, there's a copyright notice and a status bar showing '4 error(s)'.

Object	Value	Name	Description	Units	Status
100.EV3	0	Event 3			
100.SCH1	0	Scheduler 1			
100.SNTP1		Sntp Configuration			
100.VAV1		VAV Controller			
100.VVV1		VAV Viewer			
100.ZBC1		CAN2go ZigBee Configuration			joined

**Scheduler**

Default Value: 0  
Value: 0

Day	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Monday									8:00 - 19:00 Value: 1															
Tuesday									8:00 - 19:00 Value: 1															
Wednesday									8:00 - 19:00 Value: 1															
Thursday									8:00 - 22:15 Value: 1															
Friday									8:00 - 22:15 Value: 1															
Saturday													12:00 - 17:00 Value: 1											
Sunday																								

Trigger events according to the time of day and day of the week

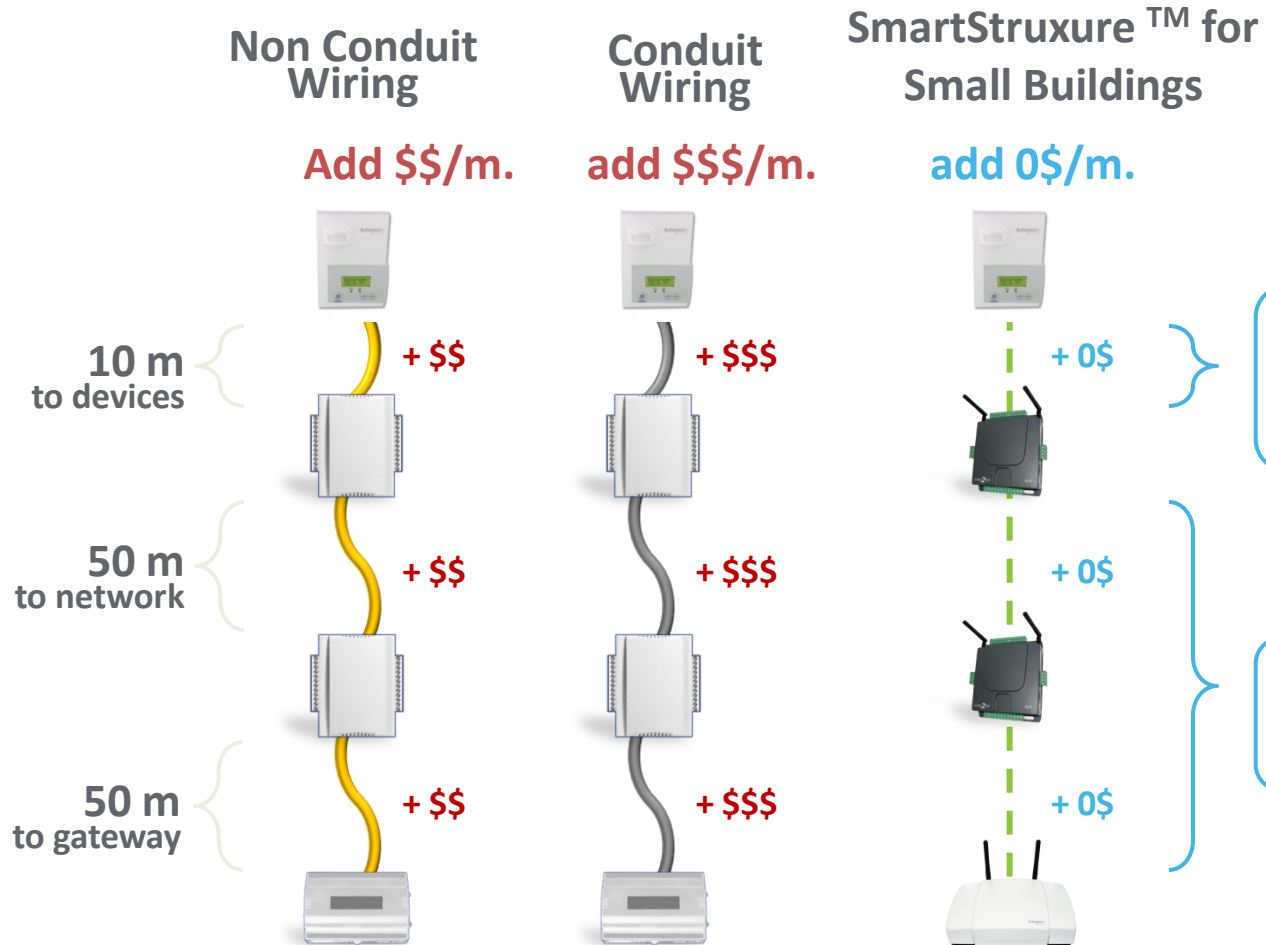
- > Pre-heat or pre-cool space in the morning.
- > Reduce consumption at peak times.
- > Close or dim systems in empty rooms or zones.
- > Close systems for the evening and night.
- > And more....

# Optimized Installation Cost

**Labor & materials comparative**



**\$ value for electrical installation**



**Learn**

- Learn button
- Auto-detect
- Or script

**Self-forming network**



*\*Statistics on Electrical mean hourly wage from the Department of Labor of the US Government*

# The cost of wired retrofits

## Every foot counts

- > Every foot of wiring is **2\$/ft** in labor and material costs
- > Every foot of conduit is **6\$/ft** in labor and material costs
- > At 30 ft or more between two points, it's probably more cost effective **to go wireless**
- > Any amount of conduit is more expensive than going wireless
- > The more wiring, the more downtime and inconvenience for your customers

## Smart Struxure wireless benefits

- > Wireless control and networking using EnOcean and ZigBee protocols
- > Deploy wireless, battery less end-devices in record time with no maintenance
- > Reduce deployment time, inconvenience and facility downtime for customers
- > Maximize labor resources, reduce electrical, repair and material costs
- > Do the jobs nobody else can by offering wireless where the wiring conditions are difficult or expensive. Are there concrete walls? Asbestos risk? Other inconvenience?
- > Regulation in certain buildings, cities and States increase the cost of wired retrofits. Get those jobs by offering the best combination of wired and wireless

# To wireless or not to wireless?

Wireless does not mean **NO** wires



It means **less** wires

Use wireless where it is more cost-efficient than wiring

# Wireless protocols of Smart Struxure



**Apps:** HVAC, lighting, access, metering

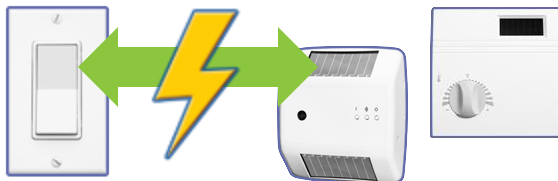
**Power:**

- > No batteries, no wires
- > Energy harvesting

**Control & Networking:** Room level

**EnOcean Alliance:** 300 members, 1000 interoperable products, in 200K bldgs.

EnOcean energy harvesting



**Apps:** HVAC, lighting, access, metering

**Power:** Power supply or battery

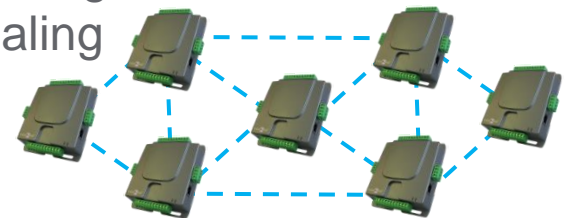
**Control & Networking:**

- > Room, zone and floor level
- > Wireless mesh network

**ZigBee Alliance:** 400 members

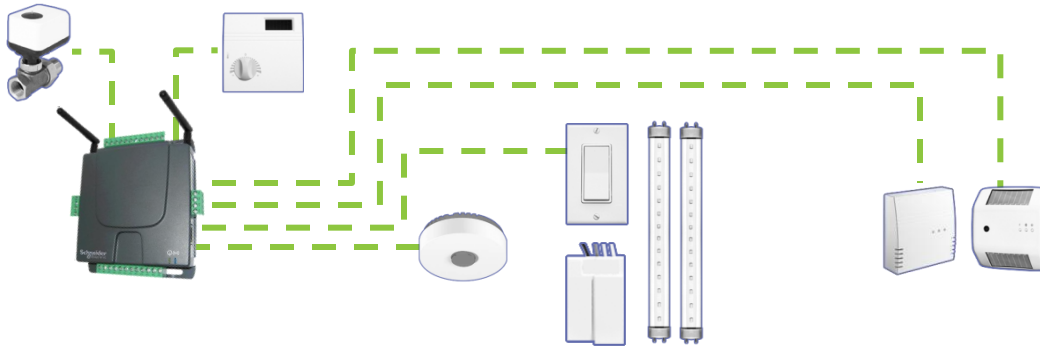
ZigBee wireless mesh

- > Self-forming
- > Self-healing



# Wireless keeps adding value to projects

## Wireless



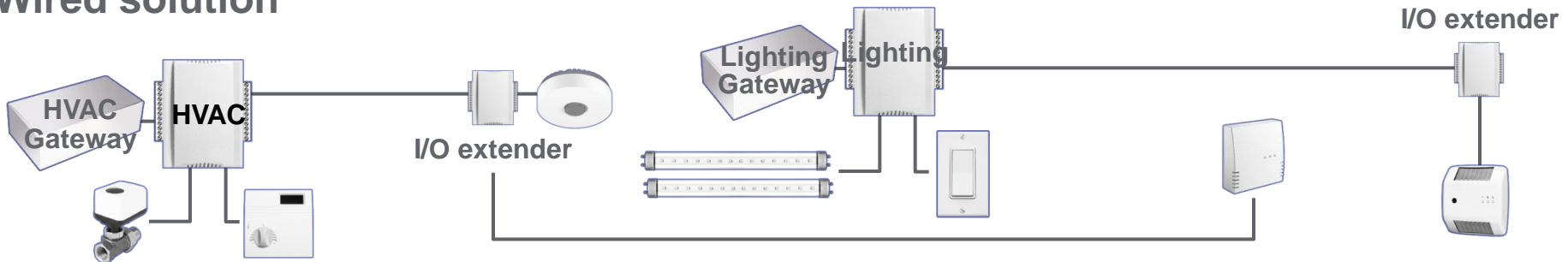
Adding points and upgrading systems is easy with Smart Struxure

- > Cost-effective
- > Wireless control
- > No point count limit
- > HVAC, lighting and other applications in-one-box

Keep your customers coming back for more over time



## Wired solution



With lower deployment costs, the payback is faster with wireless.

Starting with an HVAC retrofit (for example), the FM or building owner can decide to add lighting control and occupancy sensors once the initial retrofit is paid pack.

With traditional wired solutions, everything is more complicated and takes more time.

# At the room level

You can manage end-devices in many ways:

- > Wireless
- > Wired & wireless
- > Or just wired

Smart Struxure allows you to choose which method is more cost-effective for every project

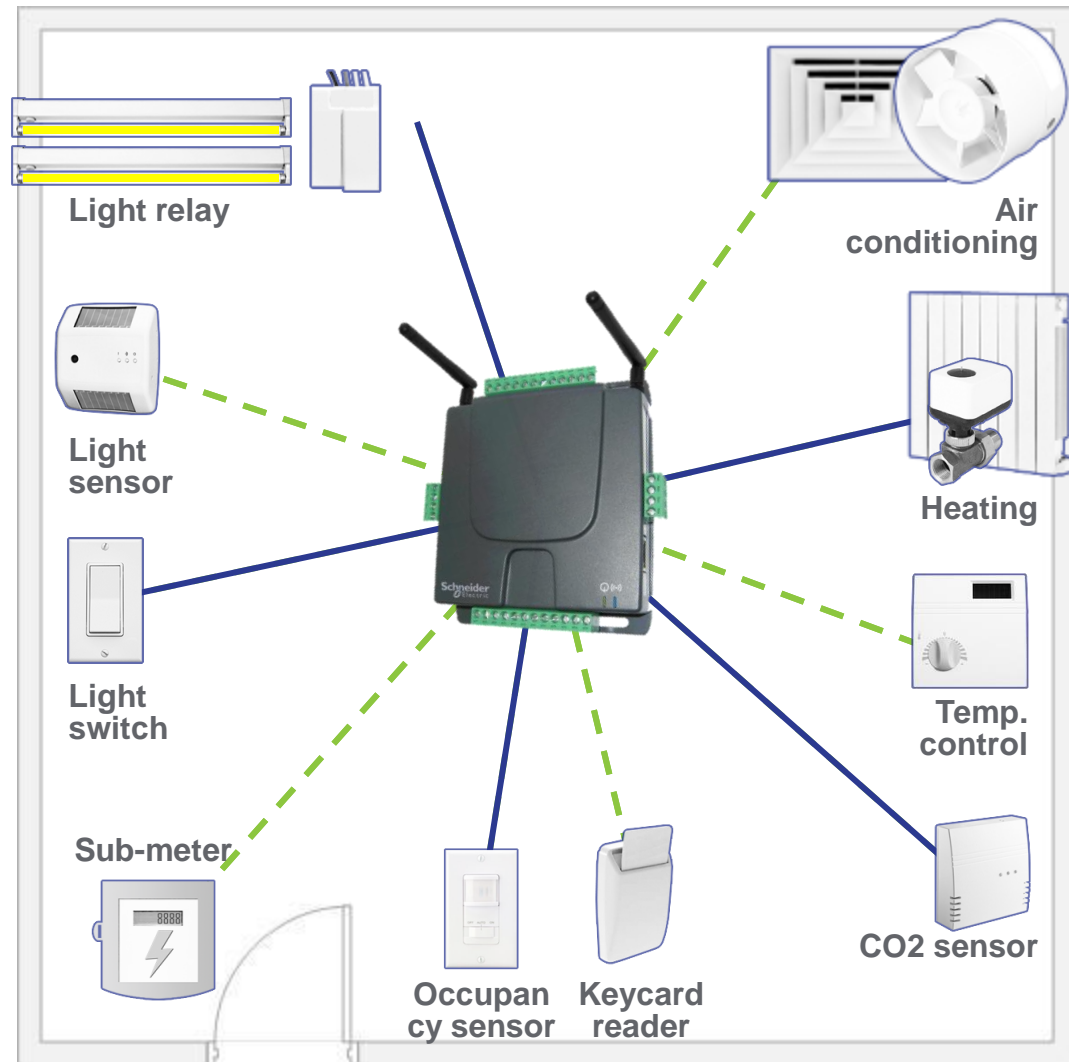
## EnOcean

**Max. of 128 points per controller**

## ZigBee

**Max. of 10 peripherals per controller**

**Max. of 75 total ZigBee devices per network of 25 controllers (including the controllers)**



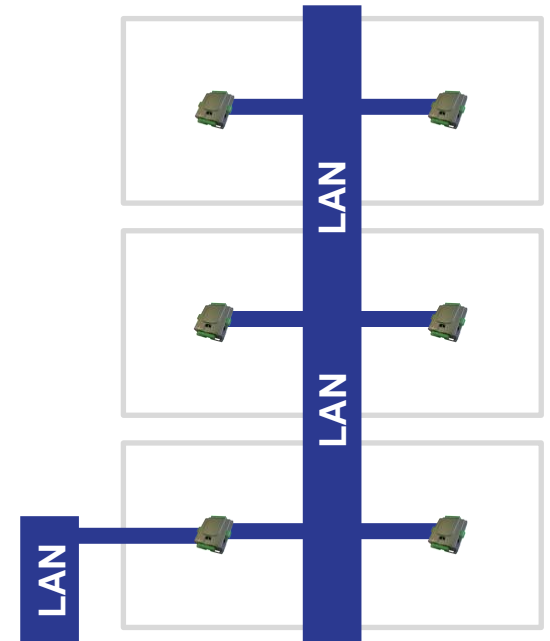
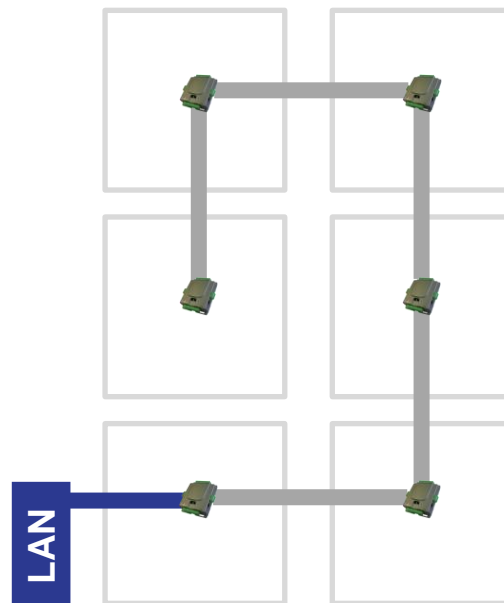
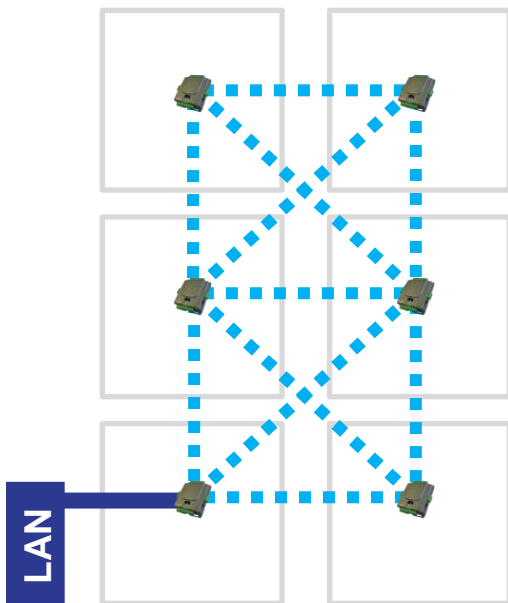
# At the floor level

Smart Struxure controllers offer you 3 networking options...

- > ZigBee wireless mesh
- > Daisy chain
- > IP/Ethernet (LAN)

For access and configuration

- > Connect one unit to the LAN per **network of 25 controllers**
- > This unit is the **monitor node**
- > For larger networks, integrate multiple network of 25 controllers to a BACnet, oBIX or other compatible system (see Web BEMS)



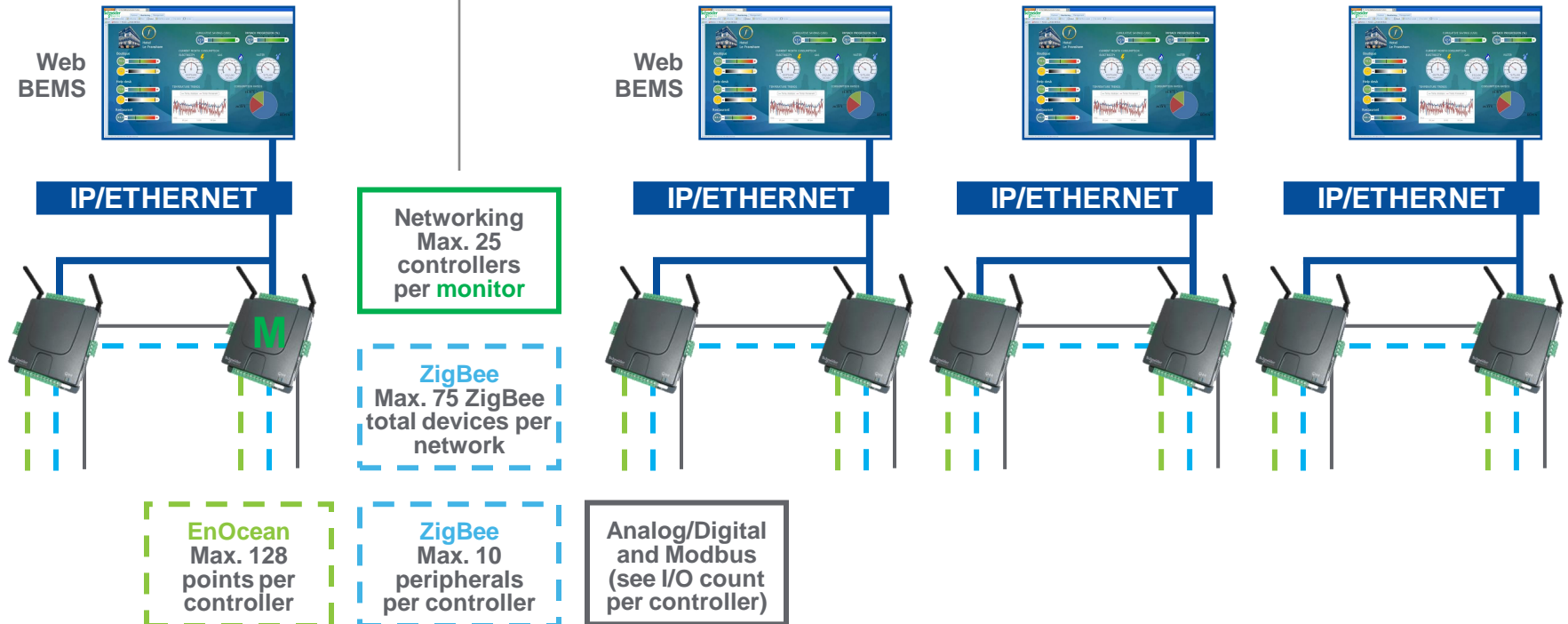
# System architecture guidelines

## Stand-alone solution

A single network of 25 controllers or less, managed entirely by the Web BEMS

## Solution for large buildings and when more than 25 controllers are required

Integrate multiple networks of 25 controllers to other systems. Point discovery is made via the Web BEMS. Overall management is made via the supervisory system (EWS, BACnet, oBIX, etc.)



# Smart Struxure Controllers

## All models have these core features:

- > Fully programmable for HVAC, Lighting & Metering
- > Web BEMS hosted by the controllers
- > In-node integration to BACnet
- > Real-time clock and Real-time response to scripting
- > 400 MHz processors, 2GB of Flash, 64MB of RAM
- > Wireless control options: EnOcean, ZigBee
- > Wireless networking options: ZigBee
- > Wired networking: CANbus, IP/Ethernet



### UN2 Universal controller

- > For any application
- > Optional Modbus connectors
- > 6/6 inputs/outputs



### VA2 VAV controller

- > For VAV boxes and any other application
- > Pressure/flow sensor
- > 6/6 inputs/outputs



### GW2 Intelligent gateway

- > No wired inputs/outputs
- > Control: wireless only
- > Clean look for situations where you can't hide the controller inside the wall or ceiling



# Smart Struxure Peripherals

Providing wireless options and distributed intelligence to commonly used retrofit applications.

- > To lower the time and cost of retrofits
- > To reduce the downtime and inconvenience to building stakeholders
- > Local memory (DA2/TE2) provides a failsafe if network communication is lost



## DA2 Wireless damper/valve actuator

For HVAC applications such as:

- > Retrofitting water based central heating systems
- > Geothermal systems
- > Chillers and cooling towers
- > Chilled beams and ceilings
- > Water source heat pumps
- > Radiant floors or chilled slabs



## TE2 Wireless terminal equipment controller

For HVAC applications such as:

- > 2-pipe and 4-pipe fan coil;
- > RTUs and small AHUs
- > Heat pumps;
- > Dehumidification units

For Metering applications such as:

- > Fast pulse counting



## SE7000 - Wireless application specific controller

Thermostat look, but can sense occupancy, adjust setpoint and control fan speed. Good for:

- > Terminal Equipment
- > Chilled Beams
- > Radiant Heaters
- > Under-floor Heating
- > Pressure Dependant VAV
- > Fan Coil Units
- > Staged Equipment
- > RoofTop Units and Heat Pumps

# Open System Enabling the Ecosystem



(Analytics, Smart Grid, OpenADR, etc...)

System Interoperability

Supervision (Local- Mobile)

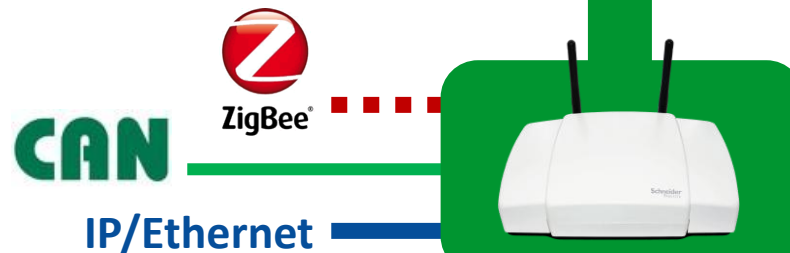
Management



Web BEMS



Networking



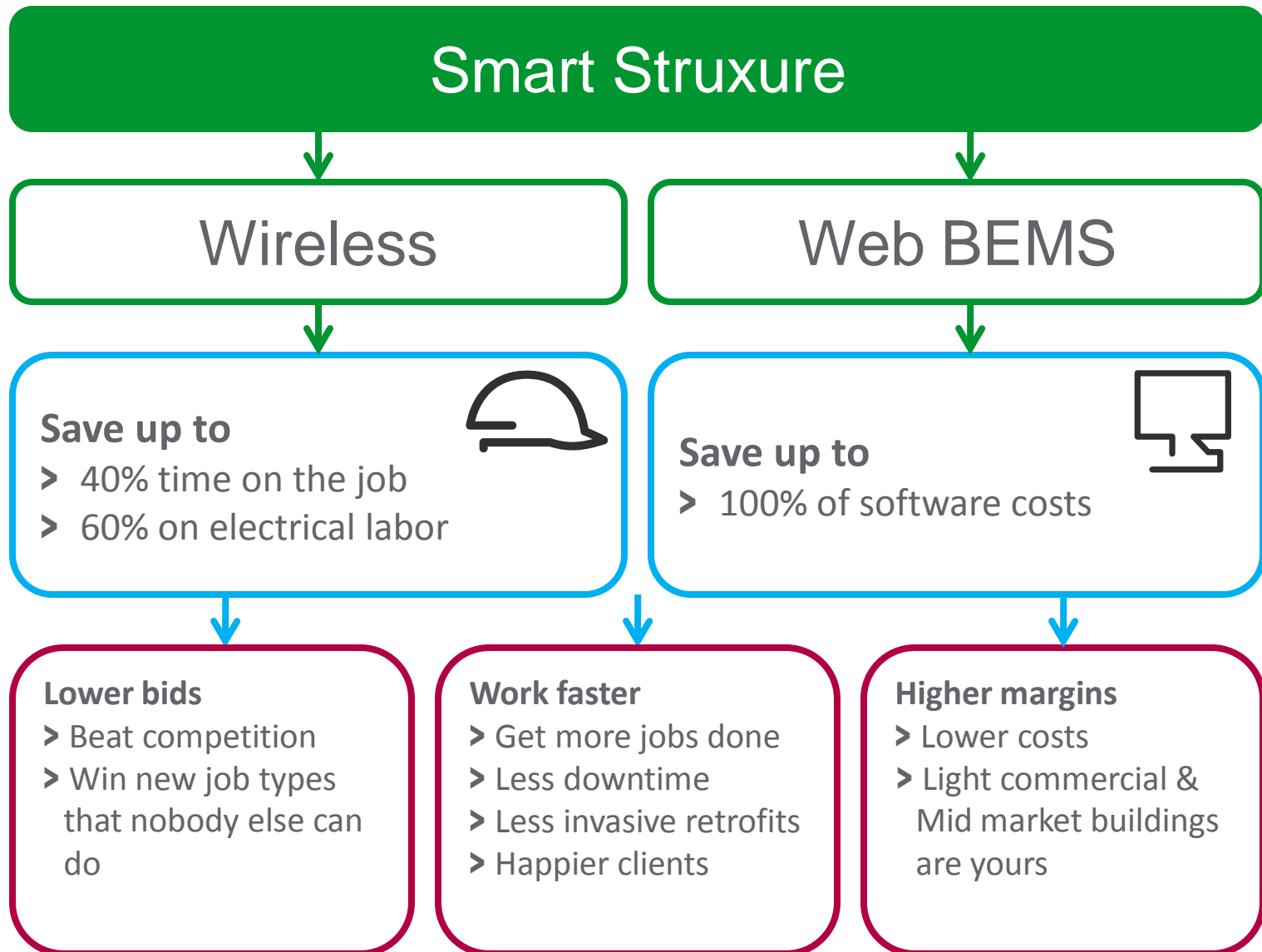
Control



Wired I/O

Input: Universal  
Output: Analog, Relay

# Quick recap: adding value to your business



# In Summary- “We Connect with Mid Market”

## SmartStruxure™ Solution for Small Buildings

### Offer Value



- Simplified Automation
- Open system
- Facilitate Retrofit

### Offer Value



- All in one: Sensor, Control, Comm
- HVAC Control Application
- Open Communication

### Partners Benefits

- Create new opportunities
- Lowest install cost
- Retrofit Champion
- Enable Services Offering



**Innovative Control Solutions for  
Small & Medium Size Buildings**

# Getting started

## Starter kits:

SK1- HVAC 1x  3x  = \$900

SK2 - HVAC & Lighting 1x  1x  3x  1x  = 1400\$

## Demo Case – \$4,390 Net **Order Now !**

Complete building automation system in a suitcase

- > GW2, VA2, TE2, SE7000, EnOcean thermostat / switch / relay and light sensor, colored LED lights, Split core CT, Android tablet and internet router.
- > All pre-configured and pre-connected for a plug and play demo.
- > Wow building owners and facility managers by showing HVAC, lighting and metering management in a single suitcase. Seeing is believing.



## Other tools for Smart Struxure integrators

- > Sales tool: Complete power point presentation including solution overview, applications and market verticals with multiple case studies
- > Partner site: iPortal with all technical documents and guidelines
- > Training and technical support: training sessions and Smart Struxure experts

# Smart Struxure Applications

Exchange 2012  
**Connect**

**Schneider**  
Electric

# Packaged solutions for retrofits

## Supervisor

EWS or other system (BACnet, oBIX) for larger buildings

## HVAC

**Pre-configured objects** for Smart Struxure including wireless devices from SE



## Management

No license fee Web BEMS



## Metering

**Pre-configured objects** for Smart Struxure including meters from SE and Veris.



## Lighting

Wired and wireless options for basic lighting to daylight harvesting from multiple vendors.



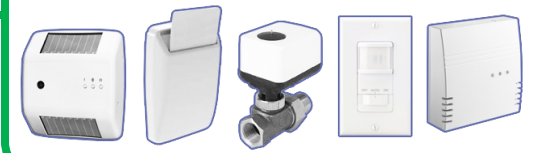
## Controllers

Wired and wireless controllers with embedded gateways and web servers



## More wireless options

100s of EnOcean products

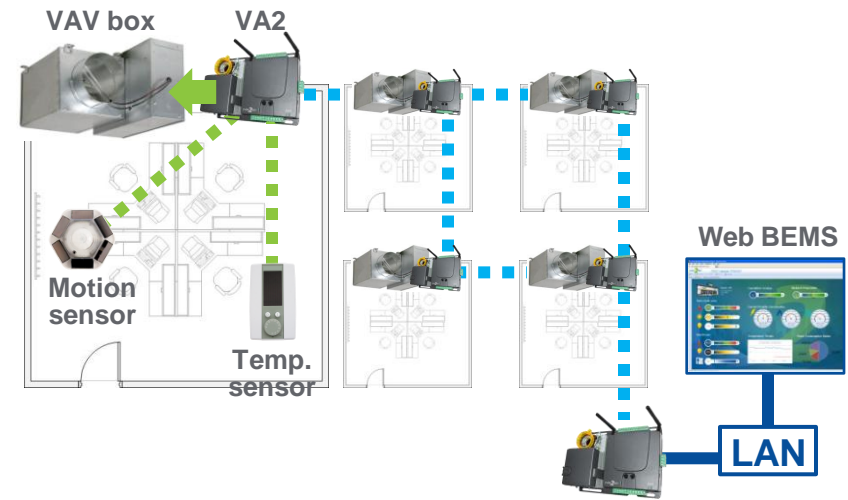


# Wireless retrofit use cases

1/4

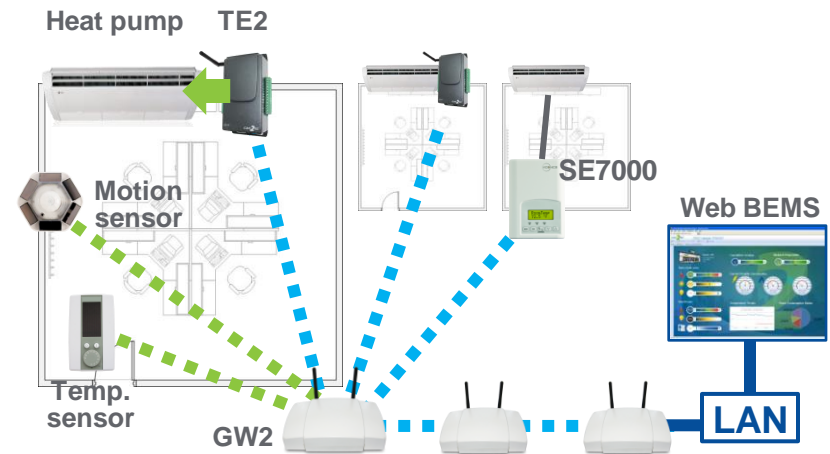
## VAV boxes

- > Use the VA2 controllers connected directly to the VAV boxes. They have embedded pressure/flow sensors and can be programmed to perform any control sequence.
- > Bring back all the points to the front-end using wired or wireless networking with other VA2, UN2 or GW2.
- > Use schedules, PID loops, custom control sequences, wireless temperature, humidity, CO2 and motion sensors to increase efficiency.



## Heat pumps

- > Use TE2 wireless terminal equipment controllers inside each heat pump. They have multiple I/O combinations, including a temperature probes input and a pulse counting input to monitor consumption. Or a SE7000 Wireless Stat.
- > Manage multiple TE2/SE7000 and any other room or zone sensors, actuators and relays with VA2, UN2 or GW2 controllers. Network these controllers to bring back to points to the front-end.
- > Use schedules, PID loops, custom control sequences, wireless temperature, humidity, CO2 and motion sensors to increase efficiency.

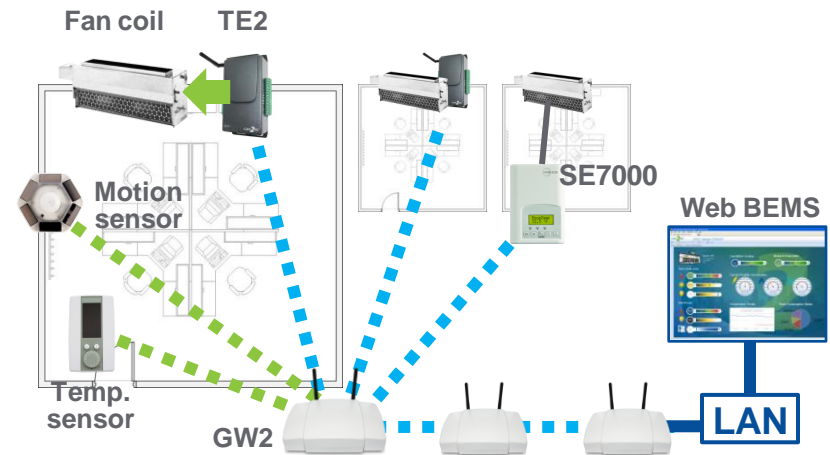


# Wireless retrofit use cases

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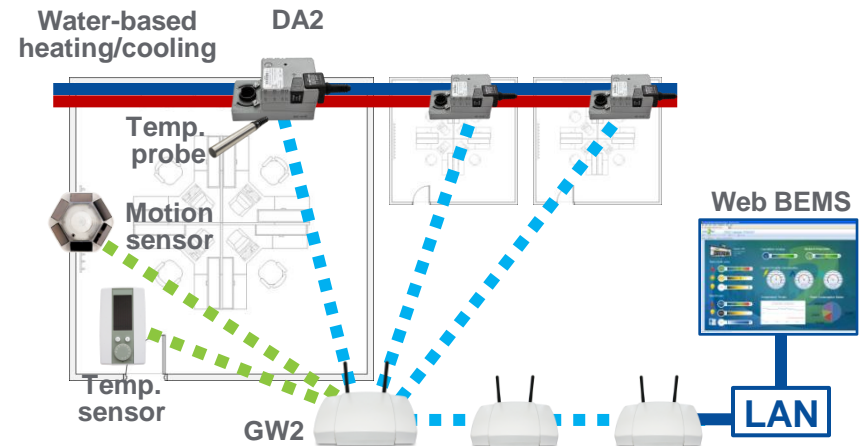
## Fan coils

- > Use TE2 wireless terminal equipment controllers inside each fan coil. They have multiple I/O combinations, including a temperature probes input and a pulse counting input to monitor consumption. Or a SE7000 Wireless stat.
- > Manage multiple TE2/SE7000 and any other room or zone sensors, actuators and relays with VA2, UN2 or GW2 controllers. Network these controllers to bring back to points to the front-end.
- > Use schedules, PID loops, custom control sequences, wireless temperature, humidity, CO2 and motion sensors to increase efficiency.



## Valve/Damper actuators

- > Use DA2 wireless damper/valve actuators to turn on/off heating and cooling according to demand.
- > Manage multiple DA2 and any other room or zone sensors, actuators and relays with VA2, UN2 or GW2 controllers. Network these controllers to bring back to points to the front-end.
- > Use schedules, PID loops, custom control sequences, wireless temperature, humidity, CO2 and motion sensors to increase efficiency.

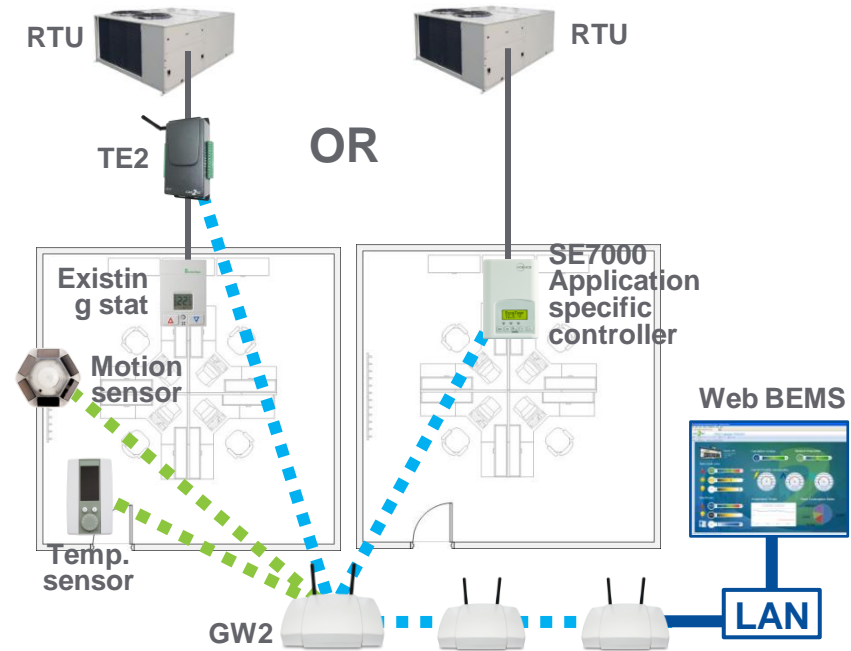


# Wireless retrofit use cases

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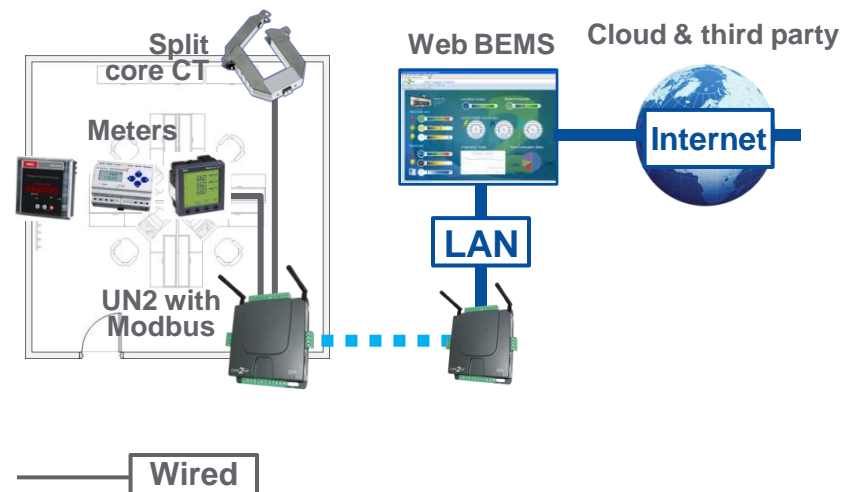
## RTUs and small AHUs

- > Use existing stats and TE2 wireless terminal equipment controllers with the RTU or AHU.
- OR**
- > Replace the existing stats with wireless application specific controllers (SE7000).
  - > Manage multiple TE2, SE7000 and any other room or zone sensors, actuators and relays with a VA2, UN2 or GW2 controllers. Network these controllers to bring back to points to the front-end.
  - > Use schedules, PID loops, custom control sequences, wireless temperature, humidity, CO2 and motion sensors to increase efficiency.



## Metering and Sub-metering

- > Use UN2 universal controllers with the Modbus option to integrate meters, sub-meters, split core current transformers or other metering device.
- > Our Web BEMS has pre-configured objects to easily manage meters from several manufacturers.
- > View metering data online via the Web BEMS. Export data to other cloud services or software solutions if needed.



--- EnOcean --- ZigBee

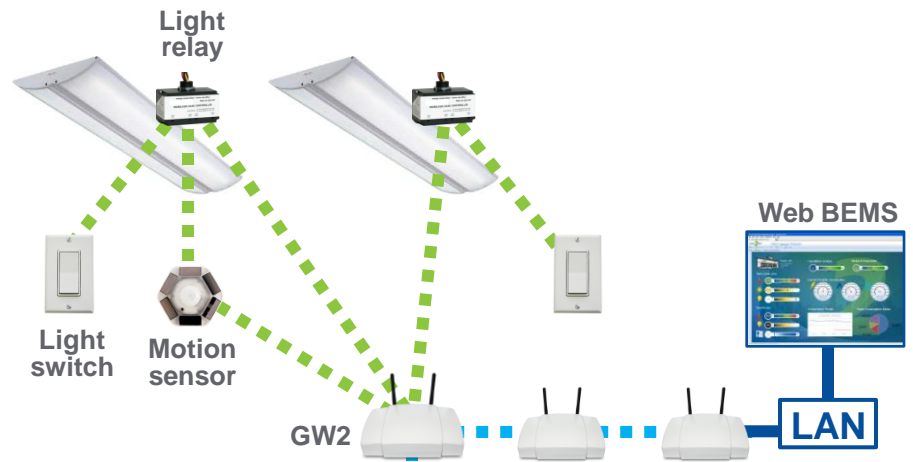
— Wired

# Wireless retrofit use cases

4/4

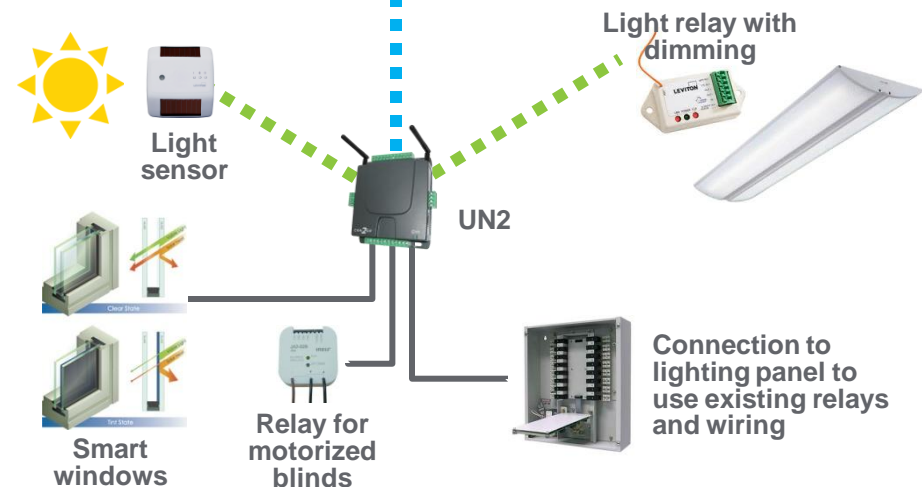
## Basic lighting control

- > Use the GW2 controllers to manage wireless relays and light switches according to schedules. Use the UN2 if you need a combination of wired and wireless control.
- > Add wireless motion sensors (also managed by the UN2 or GW2) to control lighting according to occupancy.
- > Bring back all the points to the front-end using wired or wireless networking with other UN2, GW2 or VA2.



## Daylight harvesting

- > Add light (lux) sensors to the mix to dim lights according to ambient light levels. These control sequences are also performed by the same UN2 or GW2.
- > If there are motorized blinds or smart windows that shade automatically, these can also be managed by the fully programmable UN2 and GW2. Use the UN2 if wired relays or direct connection to the lighting panel are needed.



# More on metering and sub-metering

**Forget about expensive gateways & data loggers**

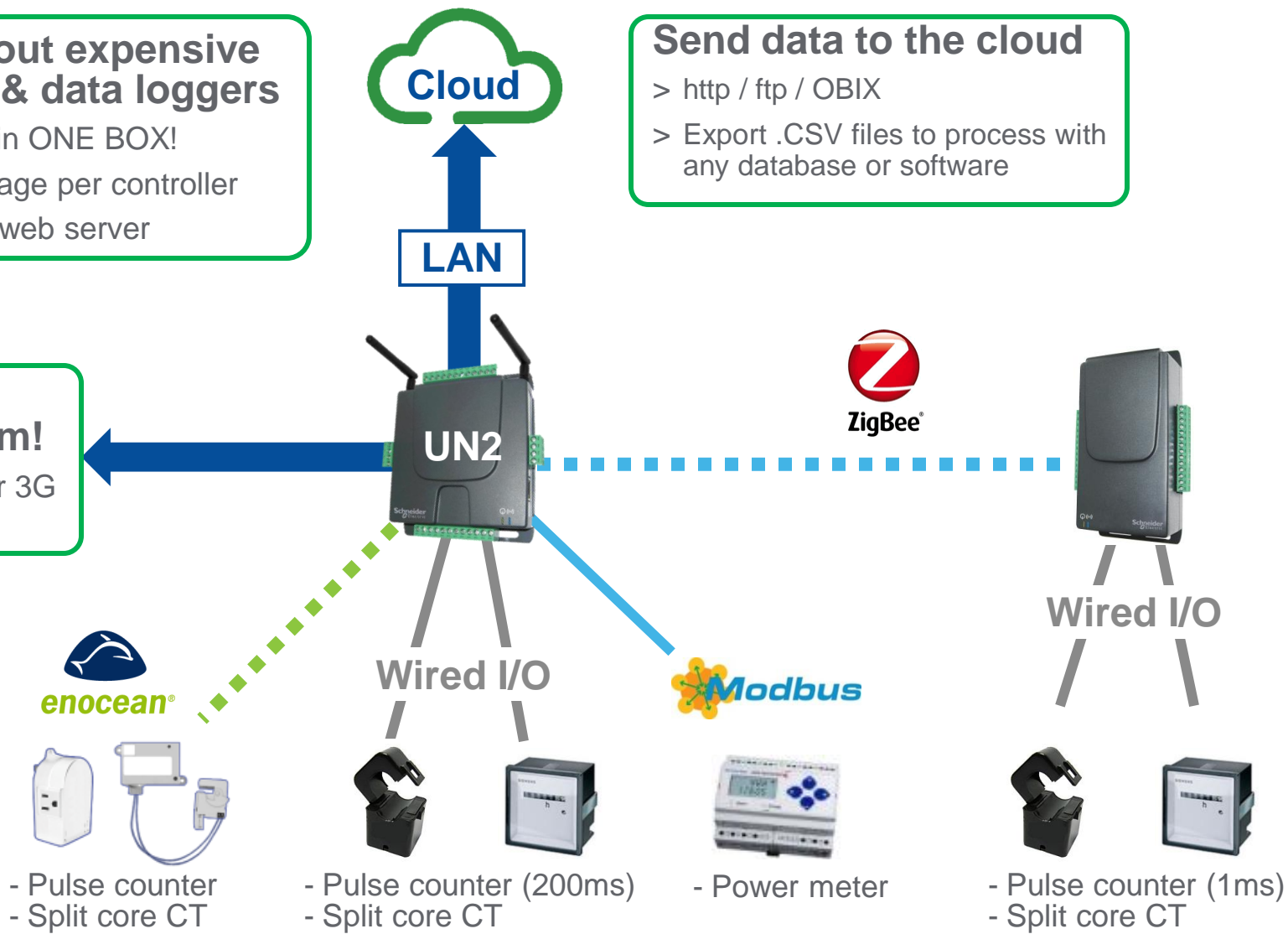
- > Everything in ONE BOX!
- > 2GB of storage per controller
- > Embedded web server

**Send data to the cloud**

- > http / ftp / OBIX
- > Export .CSV files to process with any database or software

**No LAN?  
No problem!**

- > Use a 2G or 3G VPN router



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