SPE Use Cases Commercial Buildings

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Heating, Ventilation and Air Conditioning (HVAC)

- Variable Air Volume Controllers (VAV)
- Thermostats
- Air Quality Sensors
- Chillers, Air Handling units – Variable Frequency Drives (VFD)

HVAC Summary

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Latency	Existing
VAV	Kbps	15-30watts	x00's Meters	Yes	OT	1s	RS485
Thermostat	Kbps	<15watts	x00's Meters	Yes	OT	1s	RS485
Air Quality Sensor	Kbps	<15watts	x00's Meters	Yes	OT	1s	RS485
VFD's	Kbps	No	x00's Meters	Yes	OT	1s	RS485

Vertical Systems

- Elevators
  - Cars – adding video
  - Call panel
  - Controller/supervisor panel
  - electric motors
- Escalators
  - Control panel

Vertical Systems Summary

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Latency	Existing
Elevator Car	Kbps	15-30watts	x00's Meters	Yes	OT	1s	RS485
Call panel	Kbps	<15watts	x00's Meters	Yes	OT	1s	RS485
Controller	Kbps	<15watts	x00's Meters	Yes	OT	1s	RS485
Motors	Kbps	No	x00's Meters	Yes	OT	1s	RS485
Escalator Control Panel	Kbps	No	x00's Meters	Yes	OT	1st	RS485

Health and Safety Systems

- Fire Alarms Systems
  - Smoke/Heat/Carbon Monoxide Sensors
  - Controllers
  - Alarm
  - Suppression
- Access Controls
  - Badge Readers
  - Facial Recognition/Iris Scanners/other Biometric
  - Key Pads
  - Lock actuators
  - Speaker/Alarm
- Video Surveillance
  - Video Camera
  - Video Camera PTZ
  - Video Camera – Heated

Fire System Summary

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Latency	Existing
Smoke/Heat/CO Sensor	Kbps	<5watts	x00's Meters	Yes	OT	1s	RS485
Controller	Kbps	<15watts	x00's Meters	No	OT	1s	RS485
Alarm	Kbps	<15watts	x00's Meters	Yes	OT	1s	RS485
Suppression	Kbps	???	x00's Meters	Yes	OT	1s	???

Access Control Summary

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Latency	Existing
Badge Readers	Kbps	<5watts	x00's Meters	Yes	OT	1s	RS485
Facial Recognition	1Mbps	<15watts	x00's Meters	No	OT	ms	PoE
Key Pads	Kbps	<15watts	x00's Meters	Yes	OT	1s	RS485/ PoE
Lock Actuators	Kbps	???	x00's Meters	Yes	OT	1s	RS485/ PoE
Speakers/ Alarms	100Kbps	<10watts	x00's Meters	???	OT	ms	PoE

Video Surveillance Summary

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Latency	Existing
1080p Camera	5Mbps	<5watts	x00's Meters - KM	No	OT	ms	PoE
4k Camera	15Mbps	<15watts	x00's Meters – KM	No	OT	ms	PoE
PTZ Camera (1080p)	5Mbps	50watts	x00's Meters - KM	No	OT	ms	PoE
Heated Camera (1080p)	5Mbps	100watts	x00's Meters - KM	No	OT	ms	PoE

Lighting

- Troffer
- Downlight
- Linear
- Accent
- Highbay
- Parking Lot
- Street Light
- Architectural – indoor or outdoor

Lighting

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Latency	Existing
Troffer Downlight	Kbps	30-100W	x00's Meters	Yes	OT	100ms	DALI
Linear	Kbps	x00W	x00's Meters	Yes	OT	100ms	DALI
Accent	Kbps	10-100W	x00's Meters	Yes	OT	100ms	DALI
Highbay	Kbps	100W-1000W	x00's Meters	Yes	OT	1s	None
Parking Lot	Kbps	50-1000W	x00's Meters	Yes	OT	1s	None
Streetlight	Kbps	100-1000W	Km	Yes	OT	1s	wireless
Architectural	Kbps	10-1000W+	x000's Meters	Yes	OT	100ms	DMX (RS485)

Wireless Gateways/Access Points

- WIFI
- Bluetooth
- ZigBee/Thread
- RFID Readers
- Distributed Antenna Systems
  - Mobile services in buildings

Wireless Access Point Summary

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Time	Existing
WIFI	Gbps	30watts	100M	No	IT	ms	PoE
Bluetooth	Kbps	<10watts	x00's Meters	No	OT/IT	ms	PoE
Zigbee Thread	Kbps	<15watts	x00's Meters	Yes	OT/IT	ms	PoE
RFID	Kbps	<10watts	x00's Meters	?	OT	ms	PoE
DAS	Gpbs	1000W	x000's Meters	No	OT	ms	Fiber

Voice over IP Phones

- Desk Phone
  - Normal
  - High feature/power
  - Video Phone
- Wall Phones
- Intercoms
- Emergency Handsets

VoIP Phones

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Time	Existing
Normal VoIP handset	128kb or less	7watts	100M	No	Either	ms	PoE
Feature Handset	128kb	<15watts	100M	No	IT	ms	PoE
Video	2Mbps	<30watts	100M	No	IT	ms	PoE
Intercom	64Kb	7watts	100m-1km	???	OT	ms	PoE or Analog
Wall Phone	64Kb	7watts	100m	No	Either	ms	PoE
Emergency Handsets	64Kb	7watts	Up to Km	Yes	OT	ms	Analog

Other Device Types

- Window Blinds

- Electrochromatic Glass
  - Tin Electrically Controlled

- Occupancy/People Counting
  - IR, Imaging or Thermal sensors to count the number of people in a space

- RF Sensors
  - Tracking radio devices

- Wall Clocks

Other Device Type Summary

Device	Bandwidth	Power	Distance	Daisychain	OT/IT	Latency	Existing
Blinds	Kbps	>100watts	x000's Meters	Yes	OT	1s	RS485
Electrochromatic Glass	Kbps	<5watts	x00's Meters	Yes	OT	1s	CANbus
Occupancy/ People Counting	100Kbps-1Mbps	5-15watts	x00's Meters	?	OT	100ms	RS485/ PoE
RF Sensors	100Mbps	15-30W	100 Meters	No	IT	ms	PoE
Wall Clock	Kbps	<5Watts	100 Meters	Yes	OT	ms	PoE