WOOFAA Smart Demand Control Ventilation

威發・智能按需新风控制系統

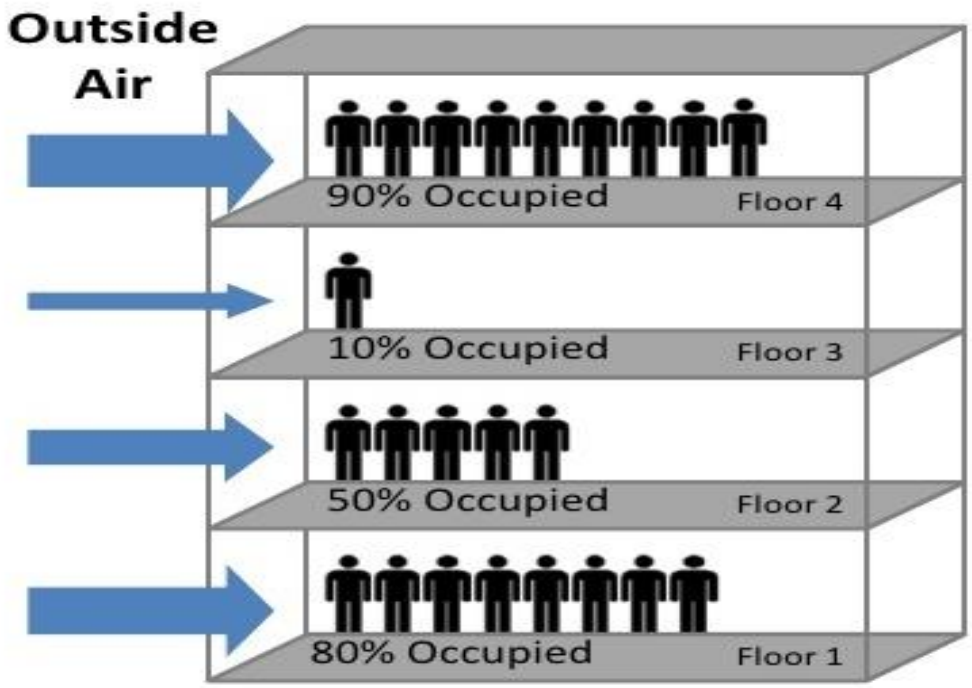
Sound of Clean Air | 焕发洁净空气 | woofaa.com | Our Ref: WFA86E19-HK

WOOFAA Smart DCV

Demand Control Ventilation – Based on VOC, CO_2 & $PM_{2.5}$

Why we need DCV?

To Save energy $$ and to reduce GHG emission

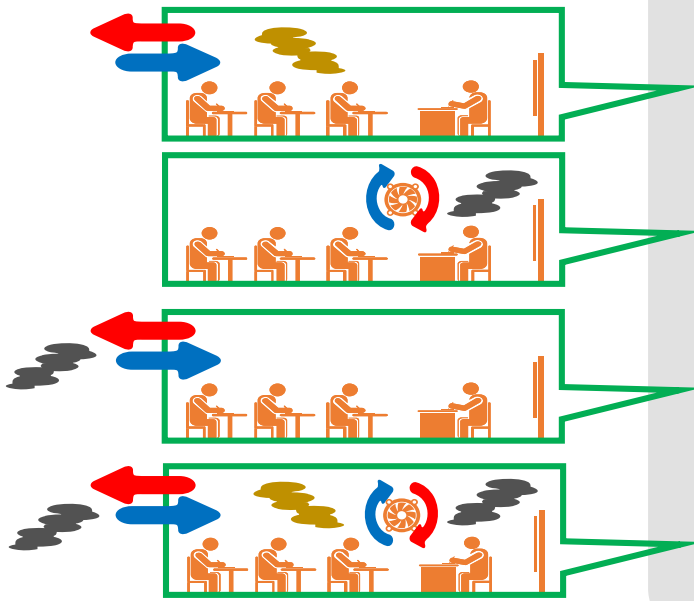


Our DCV Competences:

- **Monitor VOC, CO_2 & PM2.5**
- **Control BOTH internal & external circulations**

WOOFAA Smart DCV

Control BOTH internal & external circulations



Pollution Source	Traditional Solution
Many People: Indoor CO2	Ventilation
Smoking cigarette: Indoor PM2.5	Air Purifier
Outdoor PM2.5	Ventilation
Indoor CO2, PM2.5 & outdoor PM2.5	Vent + Air Purifier

DOAS: Dedicated Outdoor Air System

Air Purifier

WOOFAA Smart DCV

Support BOTH public and private cloud-server

WOOFAA Cloud

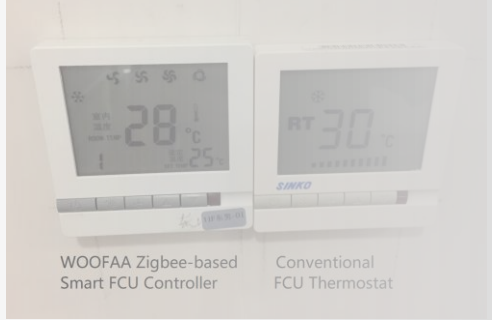
健康建筑标识 HEALTHY BUILDING LABEL

ASHRAE 62.1-2013

Smart IoT Module

Air Purifier

Smart FCU Controller



WOOFAA Smart DCV

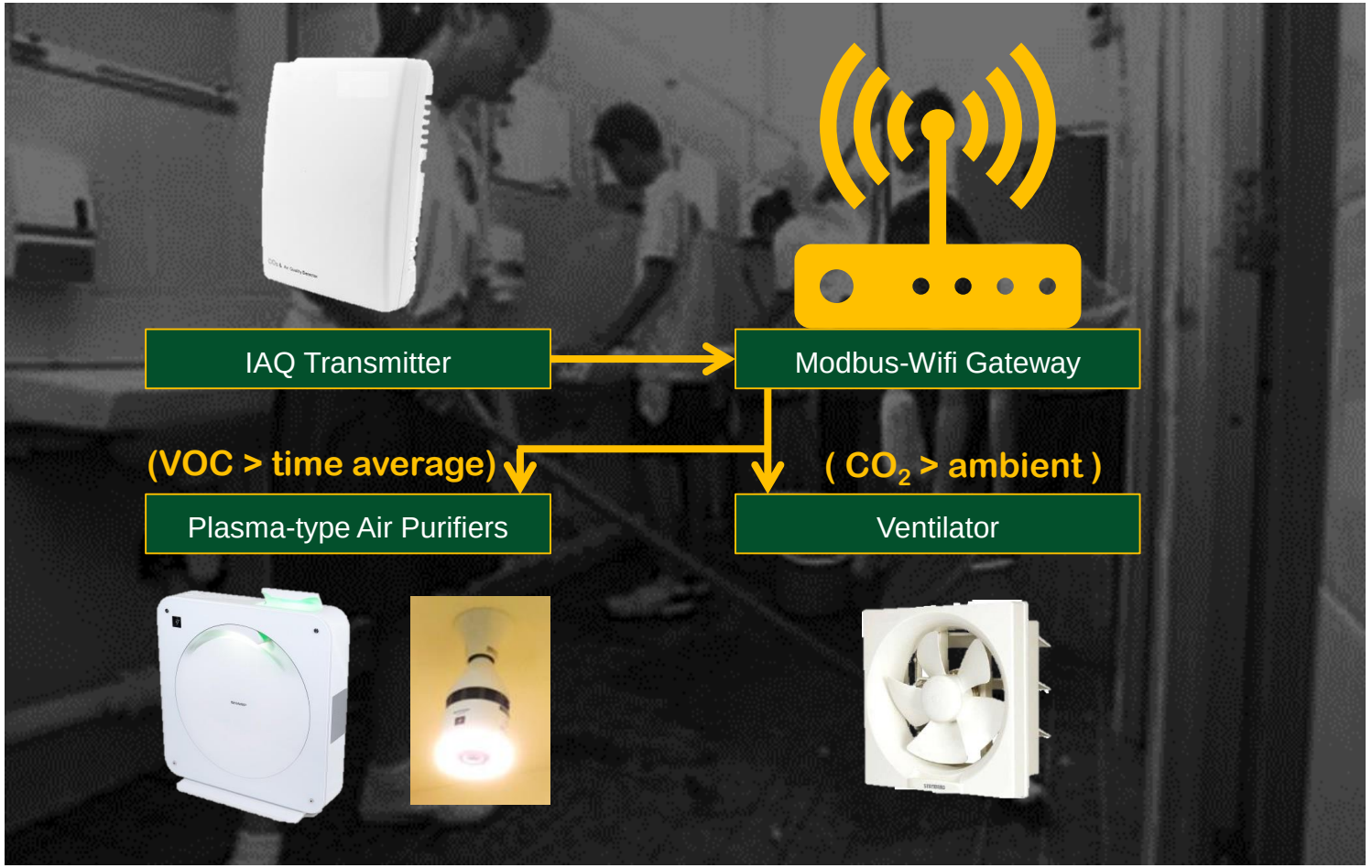
Use Case in School Toilets, Classrooms, Staff Rooms

Pain Points

- Peak usages in multiple 15-minute recess breaks
- Unwanted spills

Smart DCV

- Power-on ventilator and purifier only when occupancy is detected
- Power-off ventilator, keeps purifier on until smells vanished



WOOFAA Smart DCV

Plasma – A proven technology in removing inorganic odors, virus and bacteria

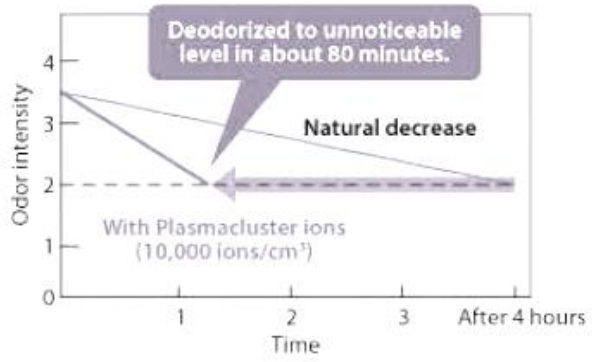
Removal of Clinging Odors

Plasmacluster ions break down and remove cigarette smoke odor components that have seeped into room furnishings in about 80 minutes to an unnoticeable level. These ions also neutralize pet odors and the odor of laundry dried indoors.

Plasmacluster

High-Density 7000

Removal of cigarette smoke odor



- Tested by the Boken Quality Evaluation Institute
- Test method: The effectiveness of deodorizing a cloth swatch impregnated with cigarette smoke odor components was evaluated by using the six-level odor intensity indication method. (Plasmacluster ion density: 10,000 ions/cm³*)
- Test result: Deodorized to unnoticeable level in about 80 minutes.

Plasma-type Air Purifiers

Removal of Clinging Odors

Plasmacluster ions break down and remove cigarette smoke odor components that have seeped into room furnishings in about 60 minutes to unnoticeable level. These ions also neutralize pet odors and the odor of laundry dried indoors.

Plasmacluster

High-Density 25000 *1

Removal of cigarette smoke odor

- Tested by the Boken Quality Evaluation Institute
- Test method: The effectiveness of deodorizing a cloth swatch impregnated with cigarette smoke odor components was evaluated by using the six-level odor intensity indication method. (Plasmacluster ion density: 20,000 ions/cm³)
- Test result: Deodorized to unnoticeable level in about 60 minutes.*1

WOOFAA Smart DCV

Use Case in Elderly Houses and Nursing Rooms

Pain Points

- Frequent inorganic odor generation
- Seasonal occupancy changes

Smart DCV

- Power-on ventilator and purifier only when occupancy is detected
- Power-off ventilator, keeps purifier on until smells vanished

WOOFAA Smart DCV

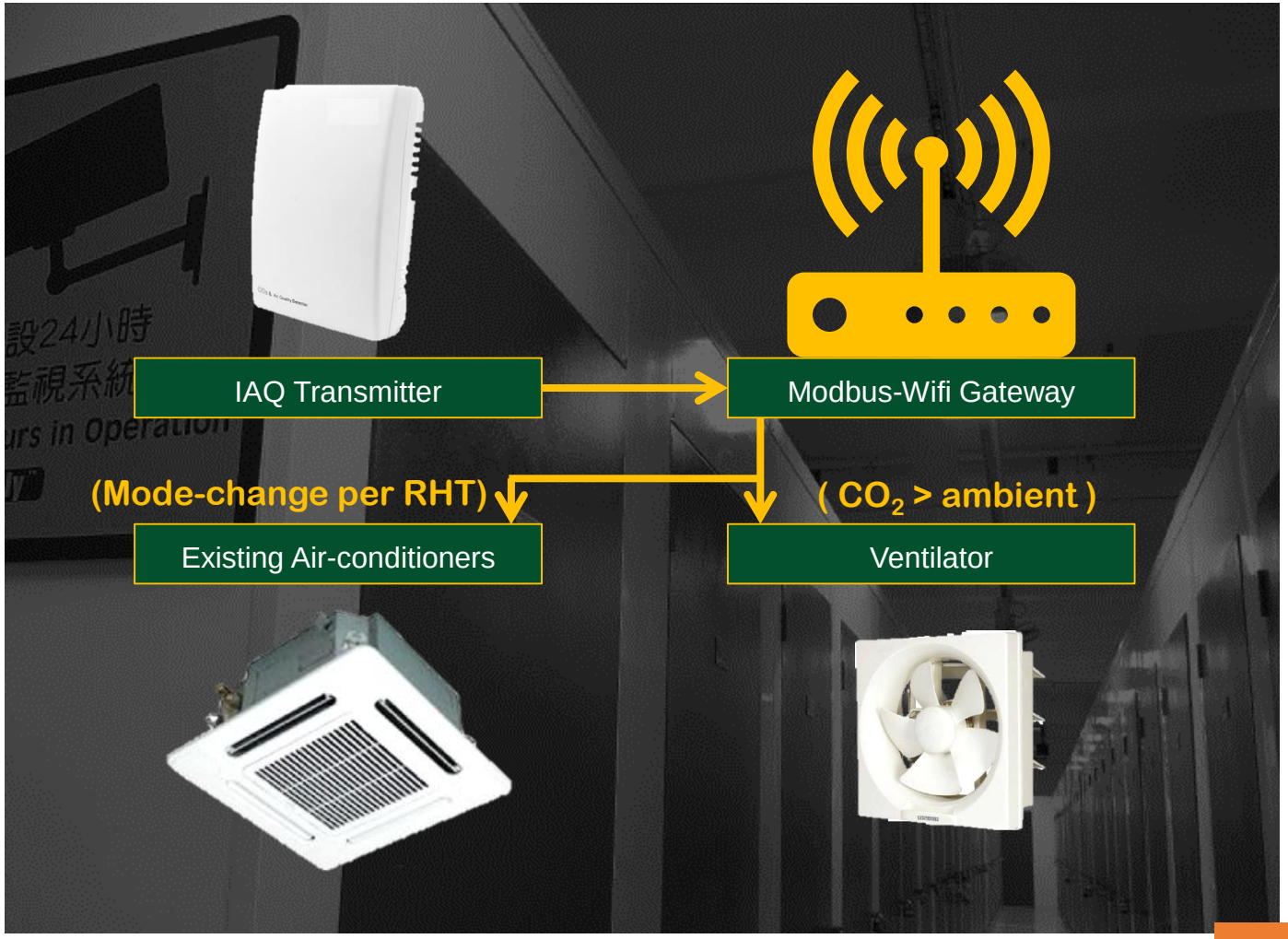
Use Case in Warehouses & Self-service Stores

Pain Points

- Random daily occupancy
- High electric bill for 24/7 air-conditioning

Smart DCV

- Power-on ventilator only when excessive occupancy is detected
- Increase A/C setpoint in vacant moments, falls back to comfort level when manned
- Monitors RH level to avoid mold growing



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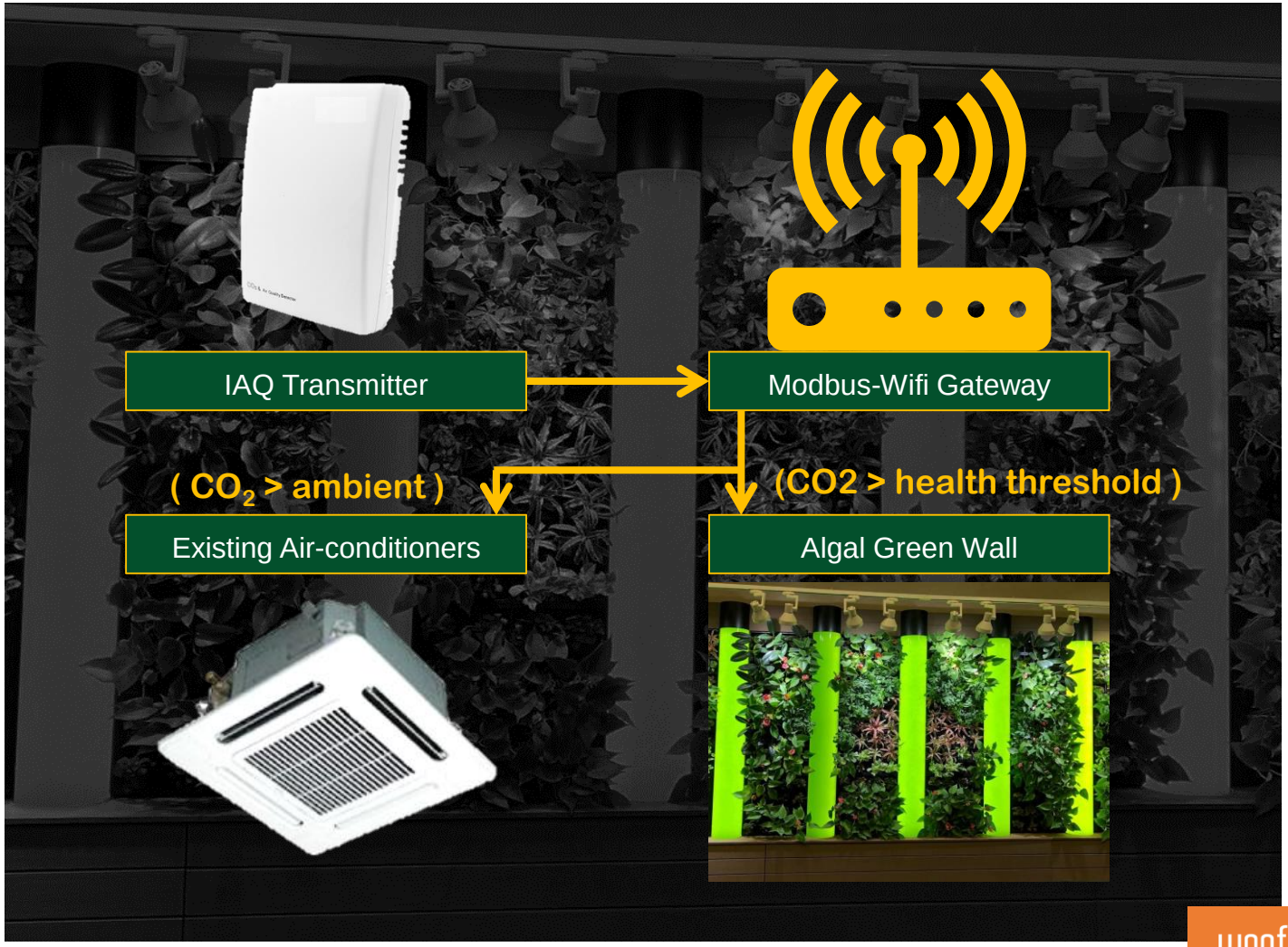
Use Case in Conference Rooms

Pain Points

- Random daily occupancy
- Often overcrowded versus design load

Smart DCV

- Increases fan speed to stir air when occupancy is detected
- Activates algal photosynthesis eco-system to decompose CO_2 and generate more O_2



WOOFAA Smart DCV

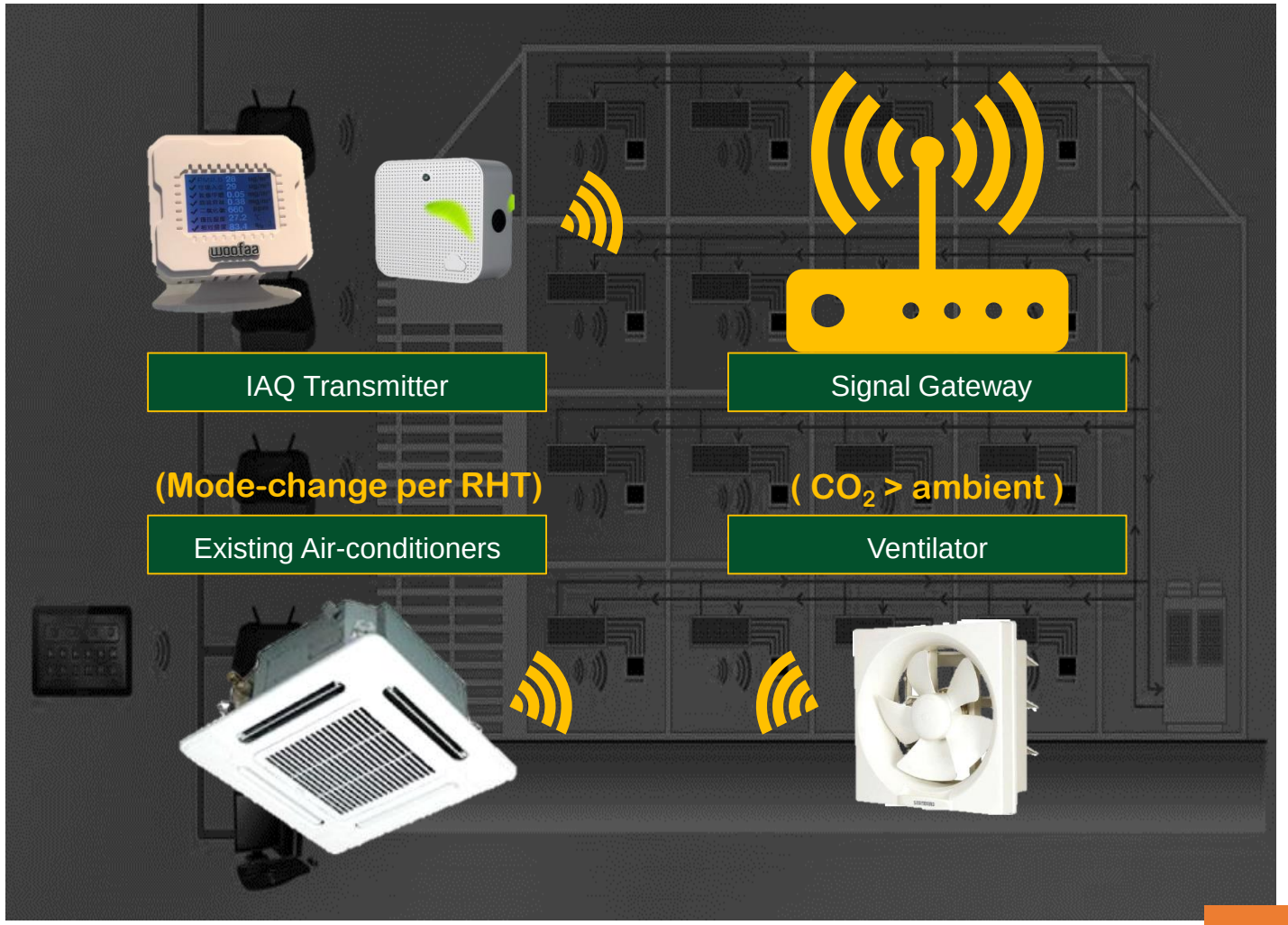
Wireless system on Wifi, Zigbee or Z-wave

When to use Which

- Multiple factors (type of occupancy, scale of system, environmental, spatial…) are considered comprehensively.

Experienced Scalability

- One IAQ + One Gateway + One Appliance
- Tens of IAQ + One Gateway per building floor + 1000+ Appliance



WOOFAA Smart DCV

Half-priced to conventional PLC and DDC systems

System Pricing (US$)

Basic System Setup:

- Conventional PLC/DDC vs WOOFAA:
  $12,000 vs $4,000

Extra Control Point (supply + install):

- $(250 + 350) = $600
  vs
  $(150 + 150) = $300

WOOFAA Cloud

健康建筑标识 HEALTHY BUILDING LABEL

ASHRAE 62.1-2013

Saving (%) & ROI (year)

Energy Bill Saving

- Conventional PLC/DDC vs WOOFAA:
  15% vs 30%

Return-on-investment (year):

- Conventional PLC/DDC vs WOOFAA:
  2-4 vs 1-2

WOOFAA Smart DCV

Demand Control Ventilation – Based on BOTH CO_2 & $PM_{2.5}$

Know Our Team Competence

Our technical team members are formally trained on building services engineering whom know the in-and-out of centralized air-conditioning systems in any scales.

HVAC Engineers
design, install and service

The WELL Building Standard™ (WELL) is a globally recognized green building institute. It establishes requirements in buildings that promote clean air and minimize sources of indoor air pollution.

WELL AP
WELL Accredited Professional, International WELL Building Institute

Our founder Marc Chow formerly worked in a Fortune 500 specialzed in building automation systems. He is well-versed in putting smart air controls to work in harmony with other building systems.

Smart Building Specialist
Marc Chow, Founder of WOOFAA

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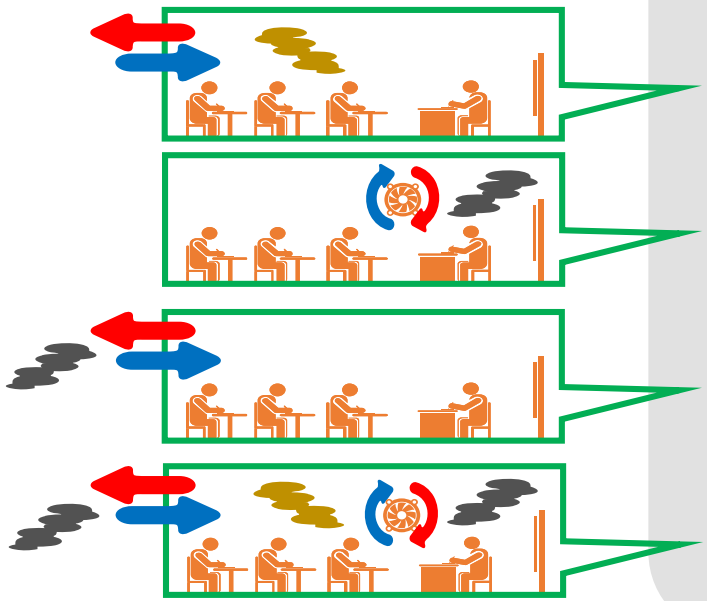


Pollution Source	User Biography
Many People: Indoor CO2	Library, Call Centre, Cinema, Hotel Executive Lounge
Smoking cigarette: Indoor PM2.5	Smoking Lounge, Joss-burning Temple Chamber
Outdoor PM2.5	Household in India, Middle East & China cities
Indoor CO2, PM2.5 & outdoor PM2.5	Air-conditioned dwellings in cities mentioned above

WOOFAA Smart DCV

Adopts various sensor types mounting methods, wired or wireless

Desktop

Duct-type

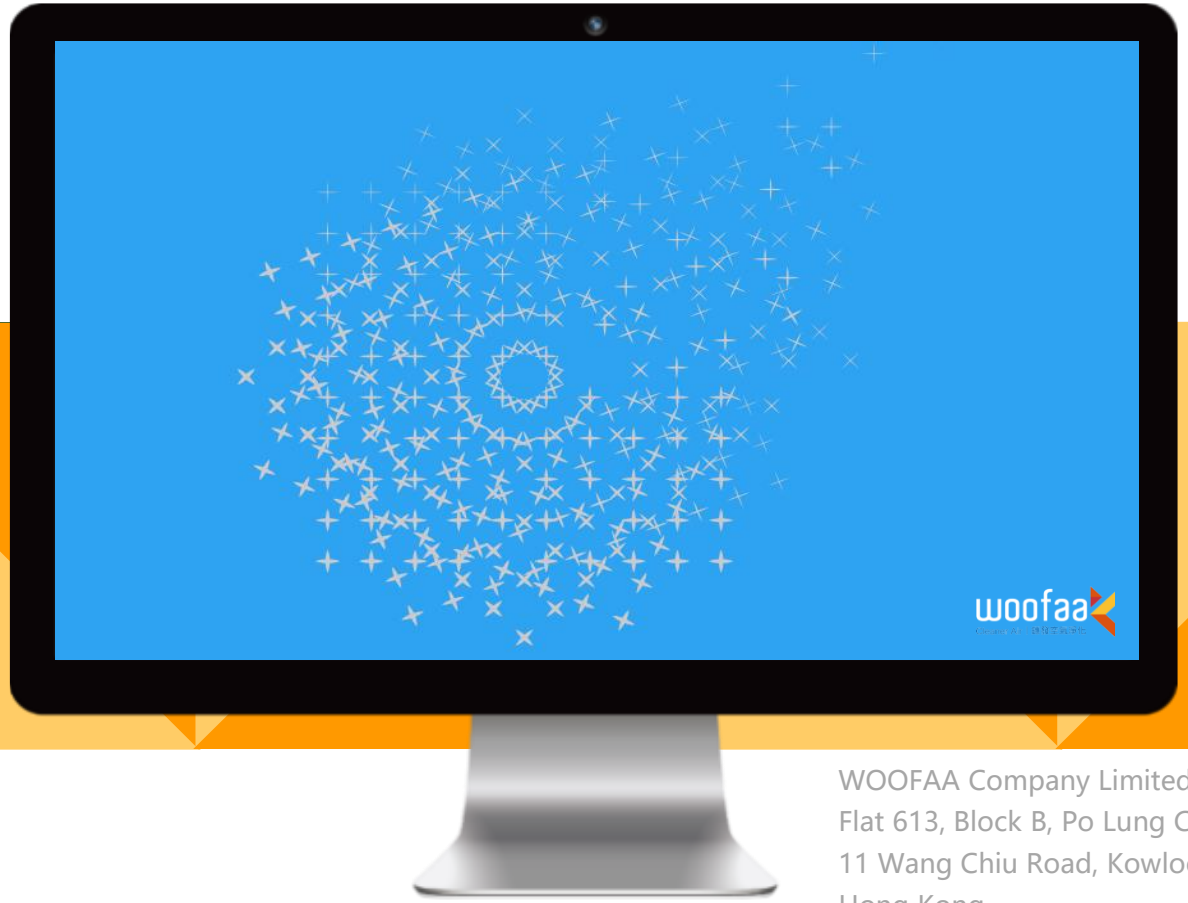
Wall-mounted

Ceiling-mounted

WOOFAA Smart DCV

Supports various types of air purification machines and technologies

WOOFAA 鏸發



WOOFAA the Sound of Clean Air

WOOFAA develops and distributes ambient air quality monitoring and control products. Our solutions embrace applications for household, educational, communal and commercial sectors.

WOOFAA 空氣淨化

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