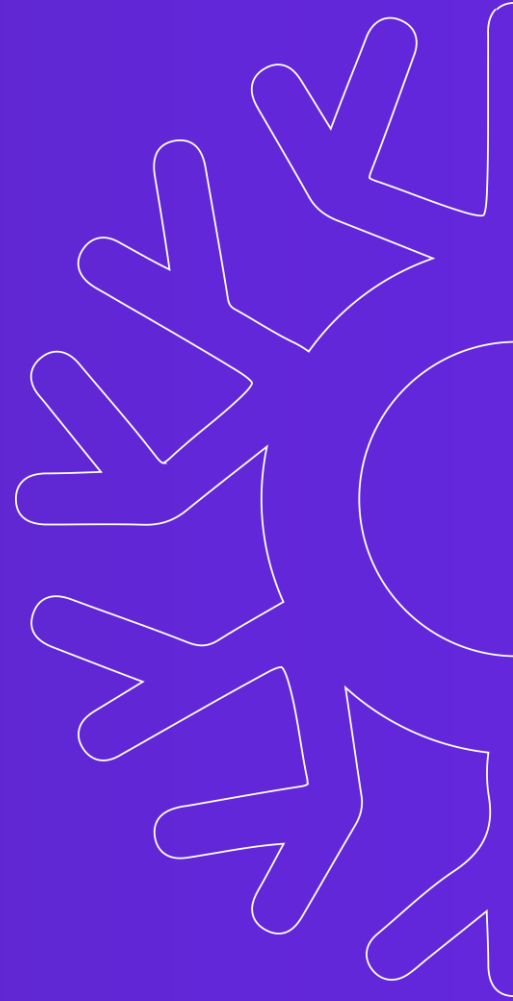


Neuron Hotel Solution



Let's look at the market landscape



Digitalisation Journey of Hotel Building Management



Data collection

Energy, water and waste consumption tracking to create baseline.



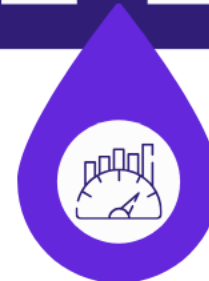
Improvement & Optimisation

- In-room smart occupancy management
- Indoor air quality and AC optimization.



Situational Awareness

Hotel equipment fault detection and diagnosis to prevent energy wastage.



Portfolio Benchmarking

- Integration with hotel occupancy statistics.
- Comparing ESG efforts among different hotels.
- Benchmarking the baseline of environmental conservation efforts and best-performing hotel comparison.



Pain Points of Modern Hotel Building Management →



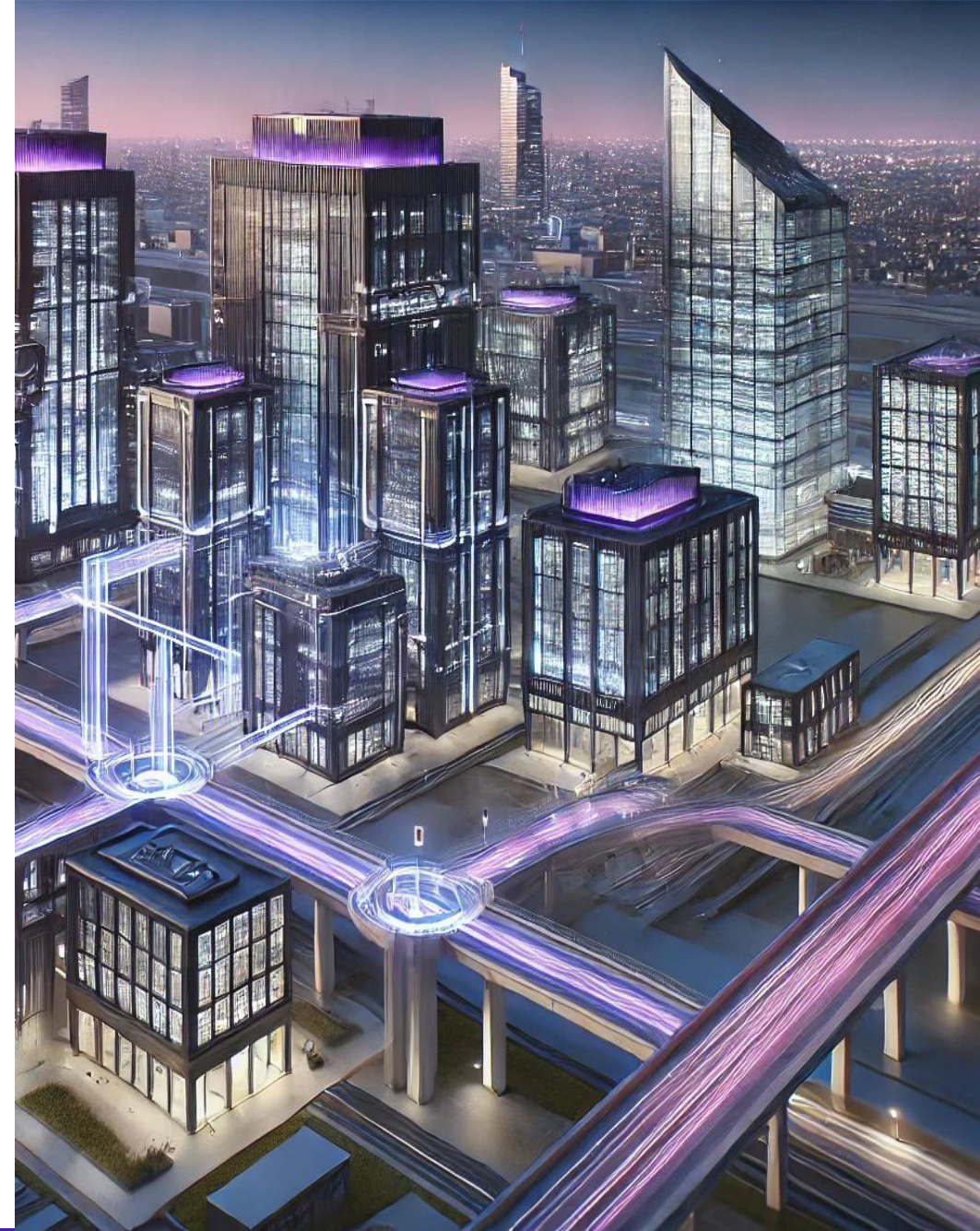
Energy and utility consumption bills are going higher, and hotel managers do not know where energy flows



Wellness, Green hotel awards and Smart / Wire Score is the future trend but don't know where to start



How might we relate occupancy rate to actual energy consumption and make our hotel contributes towards our net-zero goal?



Let's look at the what the market is doing



Well Certification



WiredScore
PLATINUM



SmartScore
PLATINUM

Smart and Wire Score

Marriott[®]
INTERNATIONAL


Hilton
HOTELS & RESORTS


FOUR SEASONS
MACAO


THE RITZ-CARLTON

THE PENINSULA
HOTELS



Neuron WELL Certification Support



AIR



WATER



NOURISHMENT



LIGHT



MOVEMENT



THERMAL
COMFORT



SOUND



MATERIALS



MIND



COMMUNITY

Internet of things sensor will be able to provide this data for WELL certification Benchmarking -

- Indoor air quality tracking
- Thermal comfort tracking
- Lux and noise level tracking

Neuron can provide WELL Accredited Partner consultancy services.



Asia SmartScore Building Coverage

What is Smart Score?

SmartScore and WireScore Certification:

SmartScore recognizes technologically advanced smart buildings that offer exceptional user experiences, drive cost efficiency, meet high sustainability standards, and are future-proof. It is a standard that identifies the best-in-class smart buildings.

WireScore certification recognizes and promotes best-in-class digitally connected buildings across the globe. It is often used by leading landlords across the globe. It empowers landlords to understand, improve, benchmark and promote their building's digital infrastructure.

WireScore Buildings in Asia (count)



Hong-Kong, Singapore & Bangkok appear as smart buildings hubs with the trend also emerging in rich middle east countries.



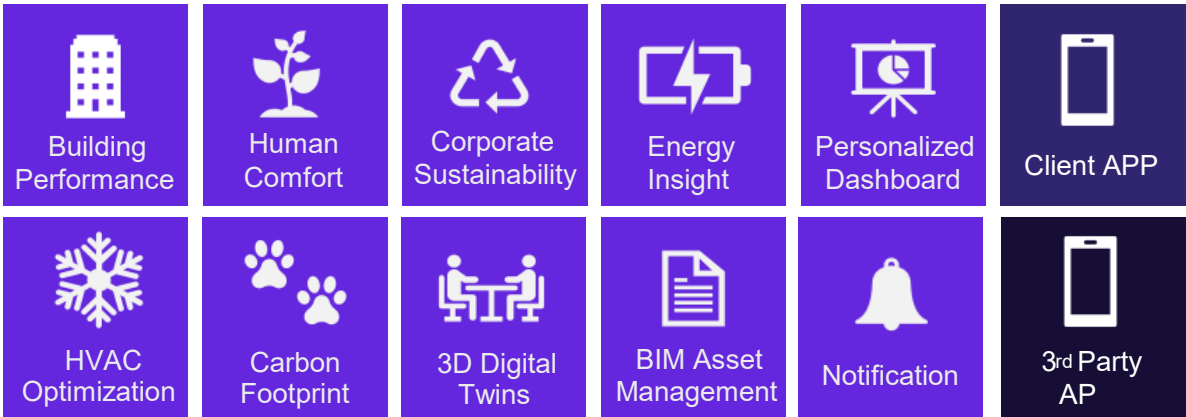
How Neuron can help?



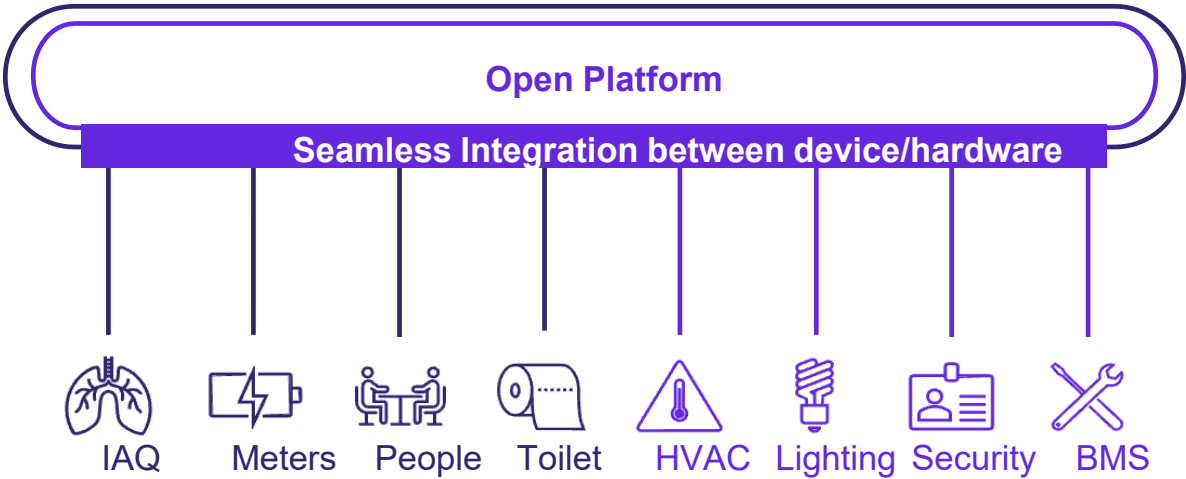
Our Solution →

Two business engines to target different needs.

Enterprise
Focus on entire building optimization



SaaS
On-demand per-device package for smaller spaces



3D Model



Asset Data



Tenant Data



**Open
Platform
NEURON**

BMS Data



Energy Data



IOT Sensor Data





IoT Hub

Carbon



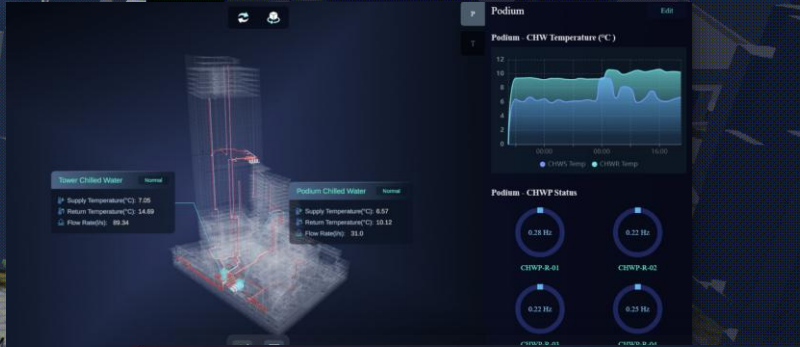
Task



ESG Management



RF - Weather Station



HVAC Optimisation

Insight Sustain Alarm



Neuron Internet of Things Sensors for creating better comfort & ESG baseline

The Neuron IoT Platform provides comprehensive dashboard templates for Internet of Things applications, including but not limited to

- Smart Toilet
- Area Occupancy relating to cooling load needs for energy conservation and comfort
- Indoor air quality tracking
- Future in-room smart control



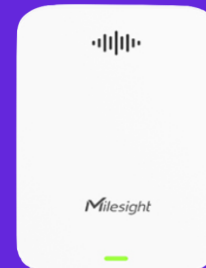
Lighting
Control



Thermostat



Air quality
sensor



Odor sensor



Smart Plug



Water Level
Sensor



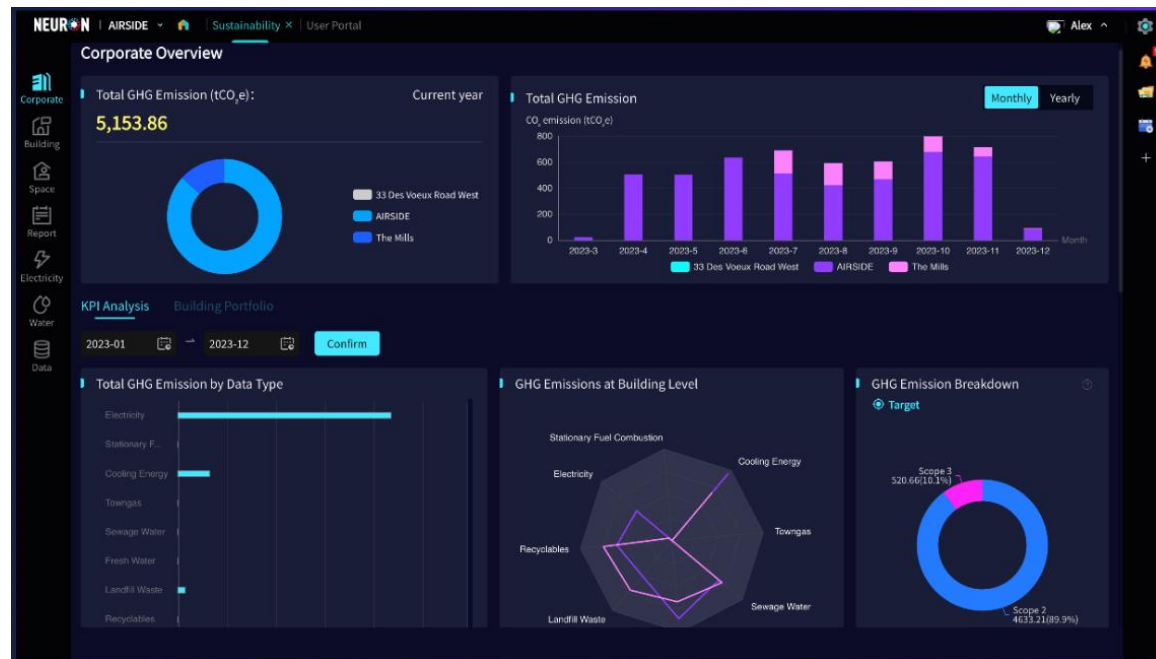
Water Leakage
Sensor



ESG - Sustainability

Customised dashboard and analytic modules:

- Corporate Sustainability KPI Individual hotel sustainability effort tracking
- Individual ESG factors tracking



Overview of energy consumption and carbon emissions

Track different sources of utility consumption

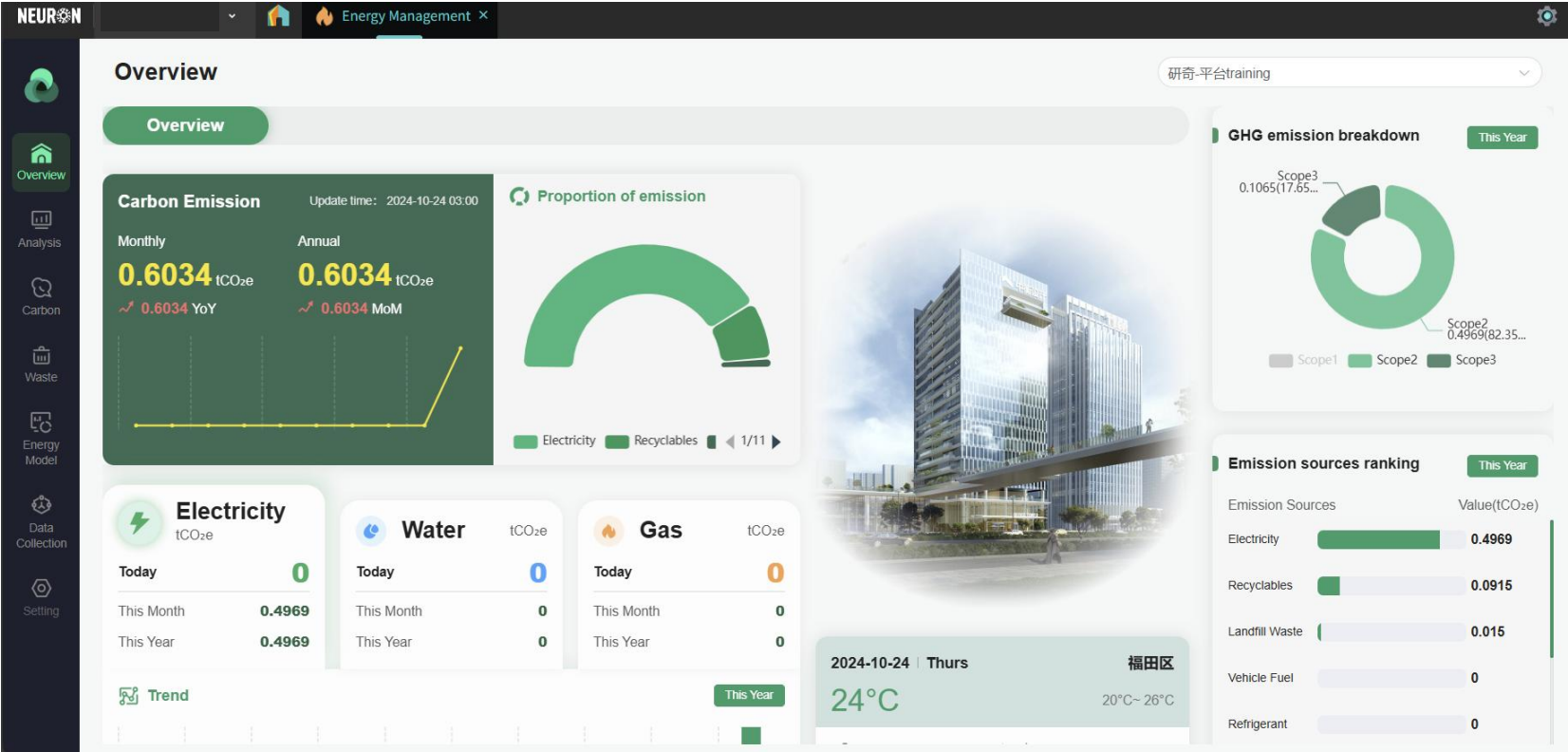
Analysis of energy consumption/carbon emission sources
Ranking of energy consumption/carbon emission sources

Carbon emission data Management

Energy Consumption/Carbon Emissions Breakdown

Energy Conservation Project Baseline Management

Create a baseline to compare the energy conservation project's impact



Hotel Utility Management Solution and Indoor Air Quality Management – Case Study

Proposal

❖ Energy Management & Carbon Emission

■ Power Metering

■ Water Metering

■ Oil Metering

❖ Optional: Waste Weighing

❖ Optional: IAQ Sensor

Assumption:

- Hotel BMS Supplier provides API for energy metering data
- Hotel Reuses existing energy meters and CTs (no need Neuron to do the recovery jobs)

Neuron Work Scope

- BMS API integration
- Data onboarding
- Second-calculation of daily, monthly, yearly energy consumption
- ESG module configuration and calculation



❖ Energy Management & Carbon Emission

■ Power Metering

■ Water Metering

■ Oil Metering

❖ Optional: Waste Weighing

❖ Optional: IAQ Sensor



- Phase 1: 6 water meters supported
- Phase 2: another sub-meters scale

Neuron Work Scope

- 6* Camera Water meters supply, installation and configuration
- Onboarding
- OCR algorithm configuration
- Second-calculation of daily, monthly, yearly water consumption
- Monthly water consumption data report
- ESG module configuration and calculation



❖ Energy Management & Carbon Emission

■ Power Metering

■ Water Metering

■ Oil Metering

❖ Optional: Waste Weighing

❖ Optional: IAQ Sensor



Neuron Work Scope

- 2* Camera Oil meters supply, installation and configuration
- Onboarding
- OCR algorithm configuration
- Second-calculation of daily, monthly, yearly oil consumption
- ESG module configuration and calculation



Energy Monitoring for Public Areas

Energy tracking suggested includes

- Utility Hub
- Banquet Area
- Restaurant Kitchen
- Restaurant
- B1 Kitchen
- 1/F lobby
- Swimming pool



Power Meters for Public Areas



4G Smart Gateway

- Support Modbus-RTU
- Max. 64 devices, 1000 data points
- RS485*2
- 4G support



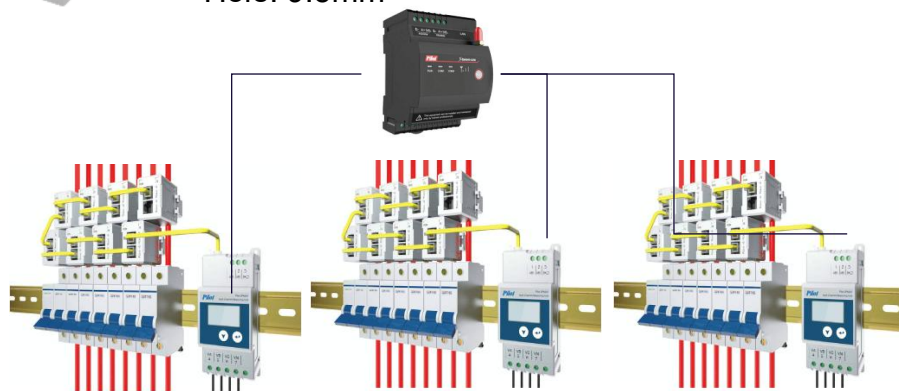
AC Multi-Channel Energy Meter

- Support Modbus-RTU
- Max. 30 single-phase, or 10 3-phase circuits
- Self-supply power



Split Core CT

- 10(50)A
- Hole: 9.5mm



5F



RS485-4G DTU

- Din Model
- Modbus RTU support
- For energy monitoring applications
- RS485*1
- Support 4G



Multi-function Power Meter

- Includes 3*100A split core CT
- RS485*1, Modbus-RTU
- Multi-tariff energy function, SOE events, Fault Recording



Multi-function Power Meter

- No CT
- RS485*1, Modbus-RTU
- Multi-tariff energy function, SOE events, Fault Recording

Split Core CT

Ratio: 200A/5A
Hole:24mm

Split Core CT

Ratio: 650A/5A
Hole: 50mm



5F

14F

15F

16F

17F



Energy Tracking for individual floors

Energy tracking for each guest floor x 10

RS485-4G DTU

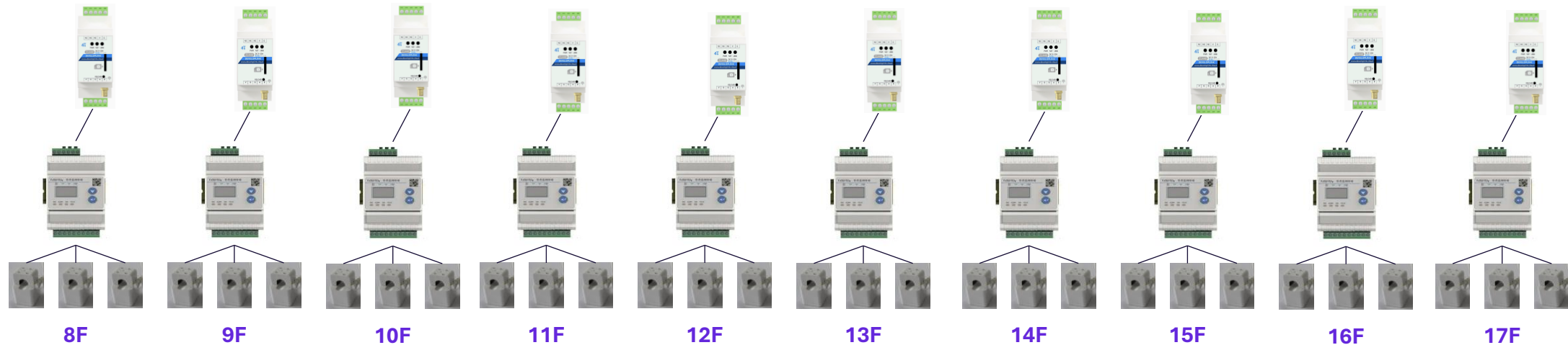


- Din Model
- Modbus RTU support
- For energy monitoring applications
- RS485*1
- Support 4G



Multi-function Power Meter

- Includes 3*100A split core CT
- RS485*1, Modbus-RTU
- Multi-tariff energy function, SOE events, Fault Recording

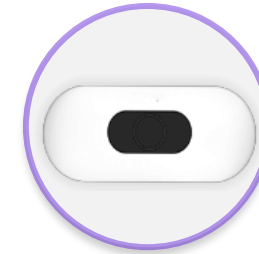


ESG | Human Comfort | Wellness

- Energy Management & Carbon Emission
- Power Metering for hotel floors
- Power Metering for public areas
- Water Metering
- ❖ Optional: People Counting

Restaurant

Swimming Pool



AI Time of Flight People Counting Sensor

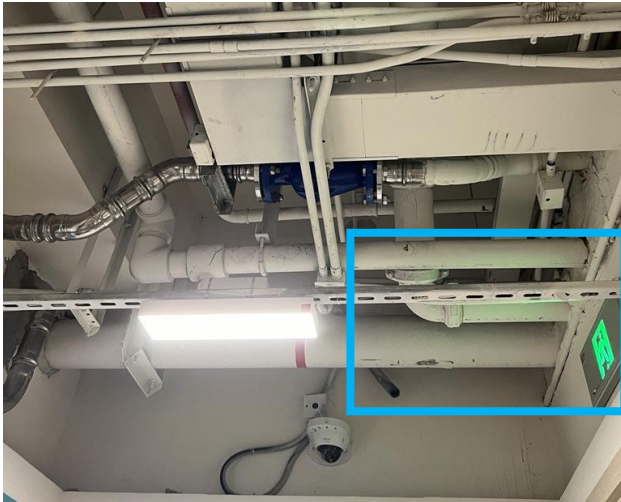
- AI Occupancy Sensor can realize space occupancy detection with high accuracy up to 99.8%.
- It can measure how many people use a space.

Features

- ✓ Multi-lines Bi-directional people counting
- ✓ Adults/Children and Staff differentiation
- ✓ 100% anonymous detection (GDPR compliant)
- ✓ Utilizes advanced ToF technology
- ✓ On-Board AI Algorithm
- ✓ Performs well in all lighting conditions including low light indoors, complete darkness and bright light outdoors



Water Consumption Monitoring & Waste Management



Water bills readings are very often different from actual meter readings. Every month's end, the facility team will need to go through all water meters, sum up all data and negotiate with the utility provider regarding the wrong bills

Water meters that are facing up and on the roof is inaccessible and pose a workplace hazard

Categorise waste management and recyclable can help trace the CO₂ of each type of waste



Hardware Specification



4G Camera meter is a 4G meter integrated with OCR metering technology. It is widely used in renewal meter like water, oil, fuel. Easy to install within non-invasive pipe.

Battery life up to 3 years for 2 times per day data collection and report.

Specifications

- Protocol: 4G
- Frequency Band: B1/B3/B5/B8/B34/B38/B39/B40/B41
- Transmit speed: Max.10Mbps(DL)/ 5Mbps(UL)
- Power Consumption: $\leq 23\text{dBm} \pm 2\text{dB}$
- Stay Current: $< 5\mu\text{A}$
- Work Current: 100mA~200mA peak 700mA
- Work Voltage: 3.3V - 4.2V
- Battery: 14505-2/3.7V/4000mAh
- Battery Life: 3 years (interval 12 hours)



Meter OCR Technology

- Automatic recognition
- High Accuracy
- Photo storage
- Support various mechanical meters



Waste management

❖ Optional: Waste Weighing

❖ Optional: IAQ Sensor

1 QR Code sticker printed for each department

- Department
- Waste Type



2

QR Code sticker attached near to the scale for centralized categorization



3

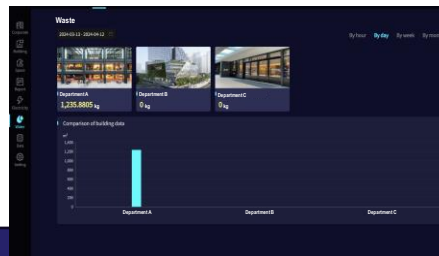
Scan the QR code by mobile phone or by QR code scanner for each bin / cage

4



The system will record the corresponding department and weight

5



Hardware Specification

Building

Department

Department

Food Waste

Paper

Metal

Glass

Plastic

Landfill Waste

Waste Scale

The current weight is

1044.12

Please select the type of waste

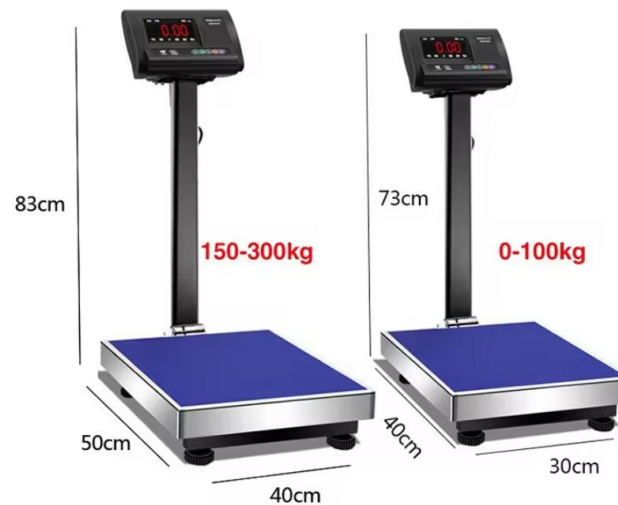
Submit



Waste Weighing Scale is made of 2 parts:

1. Weighing Scale Display and Controller: PLC & Computing & Storage data & Reporting, 4G communication inside.
2. Weighing Scale: Placement of objectives & Weighing by pressure sensors, suitable for **various waste bin**

4G Weighing Scale Display and Controller



660L waste bin

ESG solution and WELL certification

❖ Optional: Waste Weighing

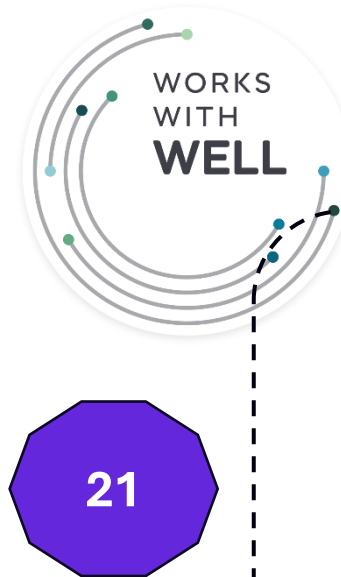
❖ Optional: IAQ Sensor

Milesight AM319 9-in-1 IAQ Sensor has officially earned the coveted Works with WELL mark.



Installation location

- lobby*2,
- CBV cafe*1,
- Chinese restaurant *1,
- Vasco Bar*1,
- Naam Thai restaurant *1,
- Resort lobby *1,
- gym*1,
- guest floor L5-L18 (without L14) *1



Specifications

- Protocol: LoRaWAN
- Frequency Band: B1/B3/B5/B8/B34/B38/B39/B40/B41
- Sensors: Temperature, Humidity, Motion, Light, TVOC, CO2, PM2.5&PM10, HCHO
- LED & Buzzer: 1 × Traffic Light Status Indicator + 1 × Buzzer
- Display: 4.2-inch Black & White E-Ink Screen
- Power Supply: 5V/1A by Type-C Port
- Ingress Protection: IP30
- Installation: Wall Mounting via 3M Tape or Screws

AM319(L) is a compact indoor ambience monitoring sensor for measurement of temperature, humidity, light, CO2 concentration, HCHO/O3 level, TVOC, barometric pressure, PM2.5, PM10 and motion. The data will be shown on the E-ink screen in real-time, which helps to measure the indoor environment and comfort.

It is widely used for offices, stores, classrooms, hospitals, etc.



Collaboration Roadmap and Why Neuron

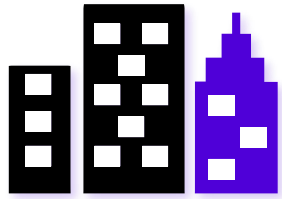


What's next

Neuron's Advantage -Our Four Open Principles

Neuron, as a pioneer in **Digital Transformation for the Built Environment**, is spearheading the future based on four fundamental principles.

By leveraging open platforms, applications, data, and technologies — especially through the integration of **Artificial Intelligence**, we are revolutionizing the innovation landscape and propelling the advancement of smart spaces. Neuron is leading the way in delivering intelligent and sustainable transformations with state-of-the-art technology and forward-thinking vision.



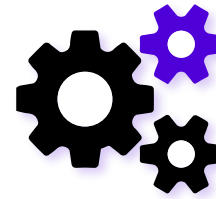
Open Platform

User-empowered platform for system and application integration with any existing hotel systems



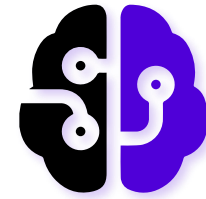
Open Data

100% visibility and accessibility of building data – all data belongs to the hotel



Open Application

Open and flexible Core Apps capable of connecting to brown and green fields. You do not need to go big or go home, you can start small



Open Technology

AI-driven and embrace latest technology in the market



NEURON

Thank you



PT. SOLUSI VISINDO TEKNOLOGI
Contact us: info@solusivisindo.co.id
www.solusivisindo.co.id