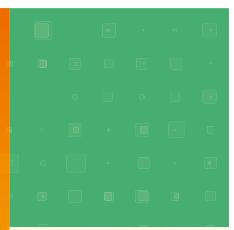


Creating Better Life

Energy Environment Education







Adding Value to IOT

IOT PLUS





IOTPLUS, Creating Better Life

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IOTPLUS expands technological services in the ICT field and leads product development to add value to IoT.

IOTPLUS Co., Ltd., established in August 2020, aims to expand technological services and develop products for a better life to all humanity and sustainable development.

The company aims to addressing global energy, environment, and education challenges by developing energy ICT and Al-based solution platforms.

With its skilled talent, braod expertise, and strong technological capabilities, the company strives to enhance IoT's value and foster a collaborative, growth-driven corporate culture.

IOTPLUS Co., Ltd.

Values



Strategic Directions



Reducing energy gap using future technologies



Working to reduce educational gap



Contributing to environmental protection

History

2024

- Selected for the [2024 Research-and-Development Innopolis Foster (R&D) Project]
- Selected for the [2024 Regional Autonomous Digital Innovation Project] (Project Duration: 2024 2026)
- Selected for the [5th Gwangju-Jeonnam Innovation Platform Energy New Industry Foster Project]
- Selected for the [Jeonnam Naju Innopolis Research-and-Development (R&D) Foster Project]
- Selected as a participating company for [Consumer Electronic Show 2025 (CES 2025)]
- Selected for the [2024 Startup Commercialization Support (Startup Leap) Project]
- Technology Transfer: Transferred Energy-Harvesting Wireless Temperature-and-Humidity Diagnostic Technology from the Korea Electrotechnology Research Institute (KERI)
- Certification for Innovative Technology-based Small and Medium Enterprises (Inno-Biz)

2023

- Approved for Special Regulatory for Demonstration by the Ministry of Trade, Industry and Energy (MOTIE)
- Selected as a promising company of Jeonnam Naju Innopolis
- Acquired ISO 14001 & ISO 9001 Certifications
- Selected for the [Innopolis Technology Transfer and Commercialization (R&BD) Project]
- Selected as a contractor for the Naju Industrial Complex FEMS (Factory Energy Management System) Construction
- Secured Investment from the Jeonnam Angel Investment Matching Fund
- Acquired [KEPCO Trusted Partner (KTP)] certification from the Korea Electric Power Corporation (KEPCO)
- Technology Transfer: Transferred patented technology from the Korea South-East Power Co., Ltd. (KOEN)

2022

- Patent Transfer: Transferred patent from the Korea Institute of Energy Research
- Executed the [Initial Startup Package Project] by the Ministry of SMEs and Startups (MSS)
- Establishment of Smart Education System using Edutech
- Executed the [Startup Growth Technology Development Project] by the Ministry of SMEs and Startups (MSS)
- Secured Investment from Jeonnam Start Up Technology Holdings (JNTH)
- Opened the EV charging system for the achievement of an Energy Self-Sufficient Rural Village (Location: No-an village, Naju, Jeonnam)
- Secured Investment from Centers for Creative Economy and Innovation, Jeonnam (CCEI)
- Selected as the contractor for Smart Collection Hub System Construction (Dong-gu District Office, Gwangju Metropolitan City)
- Certified as a Research Institute-Linked Company by the Ministry of Science and ICT (MSIT)

2021

- Establishment of an In-House Corporate Research Institute
- Certified as an Excellent Technology Evaluation Company (NICE D&B, T-4)
- Signed an MOU for Business Cooperation with Dongshin University
- Certified as a Venture Business (Innovation Growth Type)
- Executed the [R&D Support Project] for solving local community issues
- Signed an MOU for Advisory Services with the Korea Industry University Research Institute (KIURI)
- Signed an MOU for Investment with the Korea Electric Power Corporation (KEPCO)
- Technology Transfer: Transferred patented technology from the Korea Electric Power Corporation (KEPCO)

2020

IOTPLUS Co., Ltd. founded

Business Area









Hybrid Inverter ENplus(Hi – 1015)

An all-in-one system integrating renewable energy and grid power with ESS for efficient energy storage and use.

Configuration

- PCS(Power Conversion System)
- ESS(Energy Storage System)
- PMS(Power Management System)
- EMS(Energy Management System)
- V2L(Vehicle to Load)
- Safety Sensor & Safety Switch





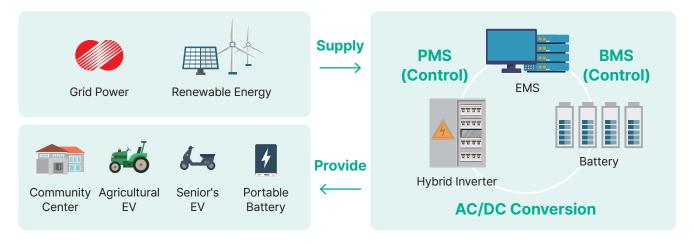






Real-Life Use

Microgrid using the Hybrid Inverter (Hybrid Inverter + ESS + EMS)

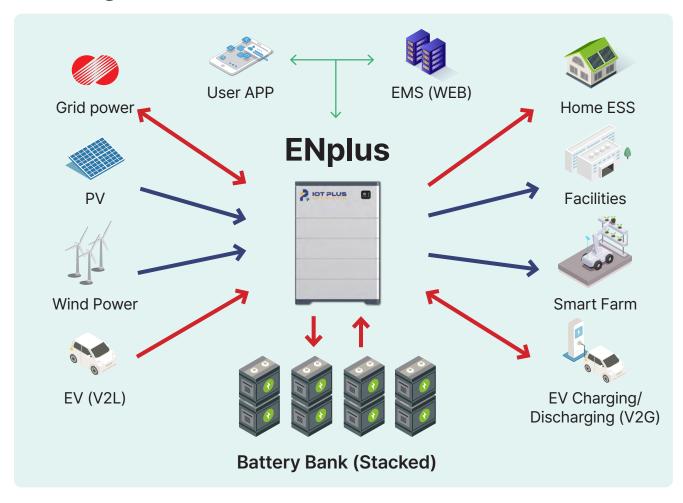


ENplus(HiD – 5050)

A system that stores renewable energy, grid power, EV, etc in an ESS for Home ESS. It can also be used as standalone portable power.



Configuration



Specifications

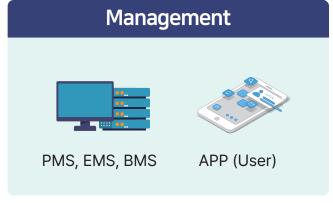
| | Classification | Hi-1015 | HiD - 5050 |
|------------------------|---|--|--|
| | Rated (Continuous) Power | 5kw | 5~50kw |
| AC Input (Power | Voltage & Frequency | 1 ph AC 170-280V -10%/+15%, 50/60Hz ±5% | 1 ph AC 170-280V -10%/+15%, 50/60Hz ±5% |
| Supply / Grid Side) | Max. Input Current | 40 Arms | 56 Arms |
| , | Power Factor | >0.99(@ Nominal) | >0.99(@ Nominal) |
| | Rated (Continuous) Power | 5 kW | 7 kW |
| AC Output | Voltage & Frequency | 1ph AC 220/230/240V ±5%, 50/60Hz ±0.1% | 1ph AC 220/230/240V ±5%, 50/60Hz ±0.1% |
| (Load Side) | Rated Output Current | 21 Arms | 29 Arms |
| | DC-AC Conversion Efficiency | 95% | 95% |
| | Energy Capacity | 9.2kWh/13.8kWh(10~15kWh) | - |
| | Cell Type | Lithium-ion | - |
| Battery | Input Voltage Range | DC 44.96 ~ 55.4V (DC 51.1V nom) | - |
| | Overcharge Protection | DC 62V | - |
| | DC-AC Conversion Efficiency | 93% | - |
| | Max. Input Power | 5kW | 50kW |
| PV Input | MPPT Voltage Range | DC 120~430V | DC 120~430V |
| (MPPT) | Maximum / PV Open-ckt Voltage | DC 450V | DC 450V |
| | Max. Input Current | 40 Adc | 56 Adc |
| Wind Power | Max. Input Power | - | 50kW |
| WIII IG FOWEI | Max. Input Current | - | 23 Arms |
| V2G | Max. Input Power | - | 5kW |
| V20 | Max. Charging Power | - | 7kW |
| V2L | Max. Input Power | - | 3.6kW |
| | Man-machine Interface | 7" full color display panel with touch screen | 7" full color display panel with touch screen |
| | Remote Control Interface | modbus/TCP | modbus/TCP/LTE |
| Common Chrs | Protective Functions | Overcurrent, Output Short, Overload, Over temperature, Output voltage abnormal | Overcurrent, Output Short, Overload, Over temperature, Output voltage abnormal |
| | | Battery voltage high/low, Battery Disconnection | Battery voltage high/low, Battery Disconnection |
| | | PV overcurrent, PV overvoltage | PV overcurrent, PV overvoltage |
| Mechanic Chrs | Dimension (W xH xD) / Weight (Approx.) | 700x1312x298mm/150kg(10kWh) | 500x500x500mm(50 ~ 100kWh) |
| | Enclosure Protection Rating | IP21 (Indoor Installation) | IP21 (Indoor Installation) |
| Environment | Operating Ambient Temperatures | -10 ~ +50 dec C | -10 ~ +50 dec C |
| Compatible | EMC | IEC/KN 61000-6-2, CISPR/KN 11 | IEC/KN 61000-6-2, CISPR/KN 11 |
| Standards | Safety | IEC/K 62477-1(2011-12) | IEC/K 62477-1(2011-12) |

Features

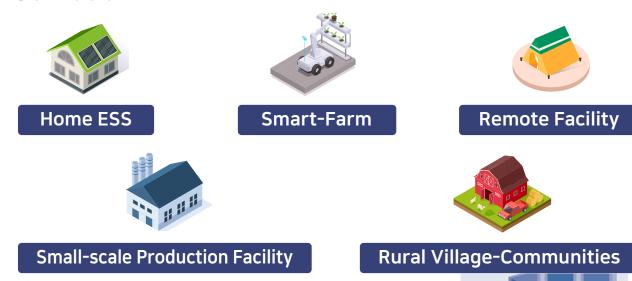








Utilization



Expected Benefits

- Reducing electricity costs through renewable energy
- Contributing to Net Zero
- Efficient power usage with remote control and real-time monitoring



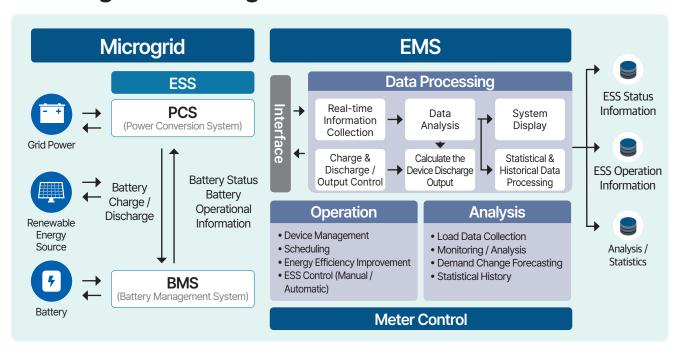
Energy Management System - Integrated

A system that integrates various energy sources to optimize consumption and improve efficiency, monitoring and managing power usage and supply in real-time for more efficient ESS operation.

EMS Screen



Configuration Diagram



Energy Management System - PMS

The Power Management System (PMS) optimizes electricity flow in real-time, ensuring stable supply and improved efficiency by managing power demand changes with the ESS.

loT_Energy Management System v 1.0





EMS Main Screen

PMS Main Screen





PMS Setting

PMS List

Expected Benefits

- Real-time monitoring and data collection
- Analyze power and standby consumption
- Control energy use, charging, and discharging
- Centralized management of energy devices for quick response

Solution 1: Constructing Energy Self-Sufficiency Village

Dae-sil Village, Bonghwang-myeon, Naju







PV & Wind Power Generator



Wind Power and Gobo Lighting



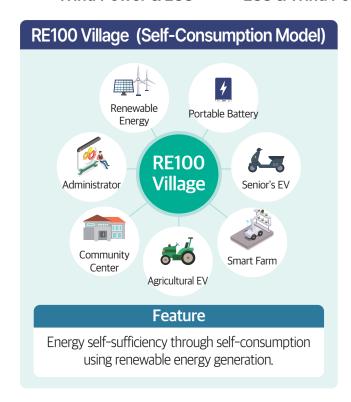
Wind Power & ESS

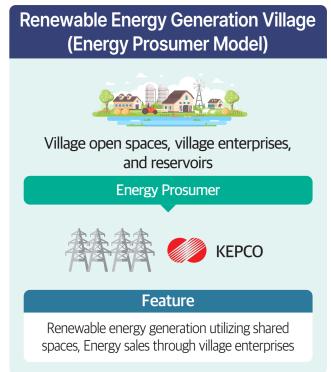


ESS & Wind Power Generator



EMS





- Expected Benefits
- Reducing electricity costs for the community
- Providing free electricity to village members
- V2L
 Generating income by selling surplus electricity

Solution 2: Energy Welfare System

Haksan-Dongsan Village, Noh-an-myeon, Naju-si



EV Charging Station



EV Charging Station using PV



Charging Senior's EV



EV Charging Station & ESS



Charging EV



Charging Agricultural EV

System to realize energy welfare in rural areas using renewable energy and ESS



- Expected **Benefits**
- Free charging for rural e-mobility
- Reducing power costs for village public facilities
- Supporting the use of local currency
- Contributing to NET ZERO

System Configuration

| Category | Standard Model (Independent Type) | General Type | Premium Type |
|--------------|-------------------------------------|--------------|--------------|
| PV | 5kW | 10kW | 15kW |
| ESS | 10kWh | 20kWh | 50kWh |
| Charger | Senior's EV: 6 / Agricultural EV: 2 | | |
| Indoor power | Community Center | | |
| Operating SW | EMS, PMS, PCS, APP | | |

Wireless Temperature and Humidity Sensor with Energy Harvesting

A technology that harvests energy from the environment to measure and transmit temperature and humidity without external power, batteries, or cables.



Harvesting Specification

► Temperature and Humidity Sensor

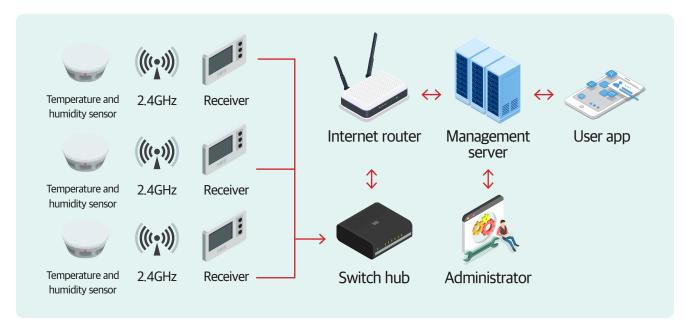
| Category | Feature |
|-----------------------------------|--|
| Power Suply | Energy harvesting (minimum operating current of 1.0A or highwer) |
| Installation Location | Incoming cable |
| Material | Flame-retardant insulator |
| Magnetic Flux Concentrator | Ferromagnetic band |
| Conductor Temperature Measurement | Range: -10°C to 120°C (±1.0°C) |
| Ambient Humidity Measurement | -40°C to 125°C, 0% to 100% RH (accuracy: ≤1.8% RH) |
| Communication Frequency | 2.4 GHz ISM band |
| Data Transmission Range | 10m ~ 15m |
| Transmission interval | Within 4 seconds |

► Temperature and Humidity Receiver Specifications

| Category | Feature |
|--------------------------------------|---|
| Power Supply | DC 12V/1.5A |
| HMI connection | Rs-485(MODBUS-RTU) |
| Material | ABS plastic |
| Communication Frequency | 2.4 GHz ISM band |
| Installation Location | Bolted on the back of the panel front monitor |
| Communication Frequency | 2.4 GHz ISM band |
| Data Transmission Range | 10m ~ 15m |
| Maximum number of sensors receivable | Up to 16 sensors |

Advantages

- Simultaneous monitoring of temperature and humidity
- Semi-permanent use without additional power supply
- System implementation without additional installation on existing power facilities
- Wireless communication ensures insulation with cable-free installation
- Prevents electric shock accidents by monitoring temperature and humidity without opening doors
- Easy installation and reinstallation with detachable setup



Applications



Expected Benefits

- Reliable temperature and humidity measurement with contact-based semiconductor technology
- Contributes to planning for maintenance and repair of power facilities using digital temperature and humidity data
- Prevents electric shock accidents by enabling monitoring without door opening
- Provides customized technology backed by proprietary expertise



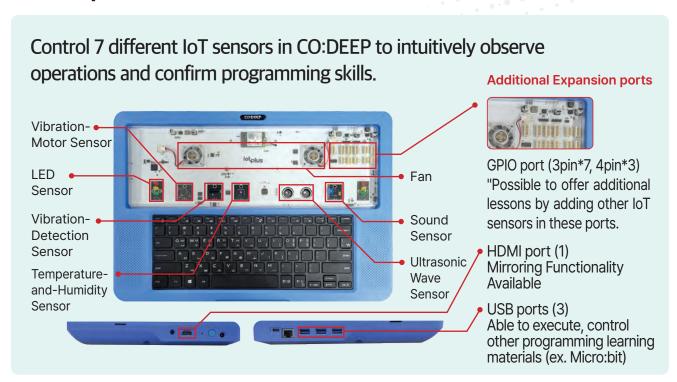


CO:DEEP

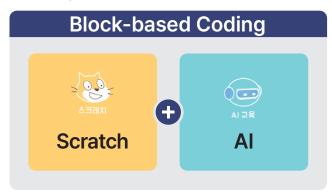
CO:DEEP, a practical AI·SW programming learning tool, is an all-in-one system which users can experience programming, or write statements on their own.

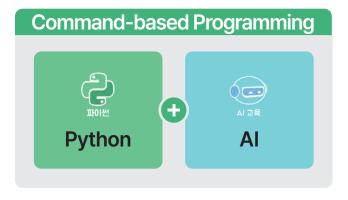


Composition



Key Point



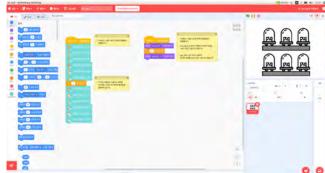


From basic to advance, selectable programming by level

Basic (Scratch)

Learn the basic knowledge(Basic Concepts, Operational Mechanisms, Hands-on Experience, etc) of programming through CO:DEEP, and advance to the next level.





Advance (Python)

Through detailed comments about the statements, learn about command-based coding and acquire real-life programming skills through CO:DEEP.





ΑI

Learn about Artificial Intelligence, from basic concepts to experience, through seven titles





CO:DEEP Steps

STEP. 01 Video Lecture



Video lecture inside CO:DEEP enables students to follow each steps and learn programming.

STEP. 02 Run Various Exercises



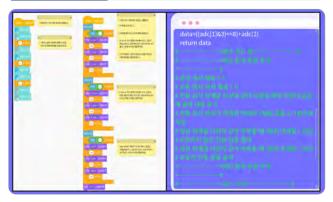
Learn the basic concepts of programming through given exercises in every section.

STEP. 03 Check the Source Code



Visually observable source codes, leading to easily understandable programming principles.

STEP. 04 Detailed Comments



Detailed comments on every statement enable easy learning of programming principles.

STEP. 05 Practice Programming



Experience programming by writing statements on your own.

STEP. 06 Check Results



Check if your statements are in order by observing whether the sensors operate properly based on your input.

♠ Curriculum

| Level | Lesson | Topic | |
|-----------------|-----------|--|--|
| Education SW | LESSON 1 | Learning the Background of Programming and the Terms of Scratch | Learning the Background of Programming and the Terms of Python |
| | LESSON 2 | Learning the Basic Syntax of Scratch | Learning the Basic Syntax of Python |
| | LESSON 3 | Practical Exercise using Scratch Basic Syntax | Practical Exercise using Python Basic Syntax |
| Basic | LESSON 4 | Controlling the | LED Module |
| | LESSON 5 | Controlling the Fan Module | |
| | LESSON 6 | Controlling the Vibration-Motor Sensor | |
| | LESSON 7 | Controlling the Sound Sensor | |
| | LESSON 8 | Controlling the Vibration-Detection Sensor | |
| | LESSON 9 | Controlling the Ultrasonic Wave Sensor | |
| | LESSON 10 | Controlling the Temperature-and-Humidity Sensor | |
| | LESSON 11 | Cross-Operating the LED Module | |
| | LESSON 12 | Cross-Operating the Fan Module | |
| | LESSON 13 | Controlling the LED Module using the Sound Sensor | |
| | LESSON 14 | Controlling the Fan Module using the Sound Sensor | |
| | LESSON 15 | Controlling the LED Module using the Temperature-and-Humidity Sensor | |
| Intermediate | LESSON 16 | Controlling the Fan Module using the Temperature-and-Humidity Sensor | |
| intermediate | LESSON 17 | Controlling the LED Module using the Ultrasonic Wave Sensor | |
| | LESSON 18 | Controlling the Fan Module using the Ultrasonic Wave Sensor | |
| | LESSON 19 | Controlling the Speaker using the Ultrasonic Wave Sensor | |
| | LESSON 20 | Controlling the Vibration-Motor Sensor using the Ultrasonic Wave Sensor | |
| | LESSON 21 | Controlling the Fan Module using the Vibration-Detection Sensor | |
| | LESSON 22 | Controlling the LED Module using the Vibration-Detection Sensor | |
| | LESSON 23 | Constructing High-Temperature-Warning System using the Temperature-and-Humidity Sensor | |
| | LESSON 24 | Constructing High-Temperature-Ventilation System | m using the Temperature-and-Humidity Sensor |
| Advance | LESSON 25 | Constructing Earthquake-Detection System | |
| | LESSON 26 | Constructing Break-in-Detection System | |
| | LESSON 27 | Constructing Auto Fan using Ultrasonic Wave Sensor | |
| | LESSON 28 | Learning the Bac | ckground of Al |
| | LESSON 29 | Al Image Recognition | |
| | LESSON 30 | Al Face Rec | cognition |
| Al | LESSON 31 | Al Alphabet Recognition | |
| | LESSON 32 | Al Voice Recognition | |
| | LESSON 33 | Al Video Effect | |
| | LESSON 34 | Al Object Re | ecognition |

Advantages



Possible to teach and learn without prior research

- Possible to teach programming without prior research using the provided teachers' guide.
- Provide different level textbooks for learners and offer 68 video lectures to enable self-directed learning.



All-in-One Tool for Programming

 Possible to learn Scratch (Block-Based Coding), Python (Command-Based Programming), and AI in one device.



From Experiential Learning to Real-Life Skills

• Learners can write sentences on their own, and visually confirm whether the sentences they wrote controls the operation.

Expected Benefits

- Possible to establish concepts about programming
- Possible to nurture ICT professionals.
- Possible to nurture developers in Al, Big Data programs, and more.
- Possible to nurture future generation's creativity and computational thinking.
- Possible to reduce technology gap between countries.

Textbooks & CO:DEEP Charger



Student's Textbook

- Providing examples about real-life usable skills
- · Curriculums based on the learner's current skill level
- Possible to proceed with learning after selecting either the basic or advanced class.



CO:DEEP Charger

- Easy storage & Easy charging
- Prevents product damage
- Ease of maintenance



Teacher's Guidebook

- More detailed explanations available
- Able to teach without prior research
- Conduct step-by-step classes following the provided guidelines



Students'



Teachers'



CO:DEEP Charger

● Expert-and-Educator-Endorsed Outstanding Product





Empirical Institution: Chungnam

Provincial Office of Education 🧷 충청남도교육청

Empirical Evaluation Team: 10 elementary, middle, and high school teachers

Empirical Evaluation Results: 4.99 out of 5

EDU+Week Future Education Fair: Innovation Coding **Tool Award**







Solution

Kumsung Elementary School (Damyang)







Damyang Girls' Middle School







Gwangju Education University







Product Information

| Model | CO:DEEP |
|---------------------------|--|
| Product Dimension | 387(W) x 283(D) x 55(H) (mm) |
| Sensor Types | LED, Fan, Vibration- Motor, Vibration-Detection, Temperature-and-Humidity, Ultrasonic Wave, Sound |
| Composition | Jetson Nano, Micro SD Card 64GB 7 Sensors, Board PCB, etc |
| Monitor Specification | 15-inch LCD 1920 × 1080(FHD) |
| Power Input | 15V 4A |
| Connectable Interfaces | USB x3, HDMI x1, Stereo jack |
| Expansion Ports | 3pin * 7, 4pin * 3 |
| Lesson | Scratch (27) + AI (7) Python (27) + AI (7) |

| Model | CO:DEEP Charger |
|----------------------|--------------------------------------|
| Product Dimension | 612(W) x 617(D) x 1107(H) (mm) |
| Internal Capacity | 24 Max |
| Power Consumption | 220V |
| Features | Tempered glass, Air-cooled cooler |
| lmage | |

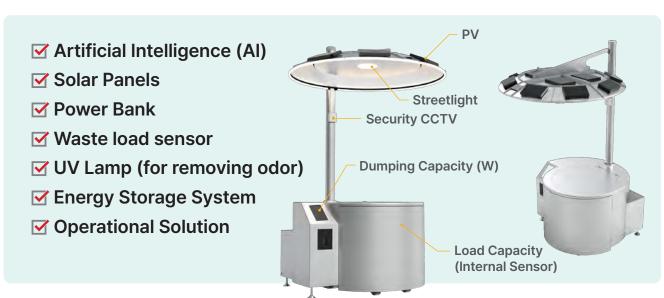


Eco-friendly Smart Collection Box

A system that uses AI to recognize and collect only certified standard waste bags



Composition



Feature



Al Technology

- · Pay-as-you-go trash bag recognition system using Al
- Recognizes pay-as-you-go trash bags and determines whether to collect or not
- Collects only certified trash bags (Prevents illegal dumping)
- If unrecognized with AI, verifies through QR Code



Features of Smart-Pole (S-Pole)

- CCTV for security (Monitors illegal dumping)
- Gobo light (For floor messages)
- Security lighting (Maintains public safety)
- Security bell (For public safety)
- Solar panels (For power supply, energy saving)



Environmental Problem Solutions

- Contributes to energy saving and carbon neutrality using PV
- Prevents illegal dumping through AI, and S-Pole
- Reduces odor with automatically sealing collection box
- Improves urban aesthetics with environmentally friendly design



Convenience & Efficiency

- Hygienic collection with automatic opening and closing
- Provides an internal odor removal system (UV sterilization)
- Accumulation of input quantity management (For rewards)
- Provides information about collection box's location
- Notificate proper operation of the collection box
- Real-time monitoring of load capacity and collection request

Application



Administrator System

Manage Removal of Trash (WEB)

Manage Collection Box, Statistics, Manage Collection Vehicle



Resident / Administrator

Usage and Management Service

Collection box capacity
Fault status
Nearby collection box location



Collection Vehicles

Collection system

Trash bin location information Trash load information



Administrative Data Utilization

Utilization of Administrative Policy data

Utilize waste collection policy Establish waste disposal prediction system





Manage Waste Load & Collection Vehicle





Automatic

opening /
closing



Collection Vehicle

Collection Box

Organization



Recognize trash bags

Al recognizes the trash-bags



2 Recognize QR Code

When error occurs, Al reads the trash-bag's QR code



3 Put inside

Put the trash bag inside the collection box



4 Collection box close

Collection box automatically closes after the put in of trash bag



5 Alarm

Alarm rings when the collection box is full



6 Error

Alarm rings when the collection box has an error

AI: Using as a detection system

Recognize standard bag

Control collection box's opening & closing mechanism

Integrated with collection vehicle + beacons

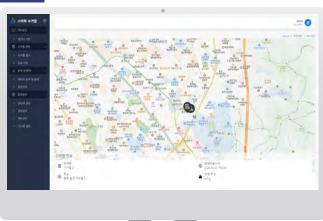
Provide various input methods (AI, QR)

Expected Effects

- Rapid collecting through real-time monitoring (Warning message when exceeding certain capacity)
- Encouraging dispersed input by providing collection box location and operational status guidance
- Possible to enforce reward policy through input quantity management
- Utilize recycling statistics through constructing pay-as-you-go DB system
- Empowering local residents to solve waste issues on their own

Integrated Control System

A system that monitors and manages data collected from multiple individual systems in real-time on a single platform.









Real-Time Management of Location-Based Products

Management of collection box operation status

Management of collection box information







Notification history management

Data analysis and statistics Input history management

Expected Effects

- Real-time data monitoring allows for quick response in emergency situations and anomalies.
- No additional devices or personnel are required.
- Enables precise data understanding and supports long-term operation.
- Effectively responds to risks such as unauthorized use, theft, and accidents.

Example

Dong-gu, Gwangju Metropolitan City

The AI-based waste collection bin recognizes volume-based waste bags, opening the lid automatically. This helps gather bags from various locations into one place and reduces odors with a UV light. It also tracks individual waste amounts and can serve as a security light or CCTV.









Specification

Eco-Friendly Smart Collection Bin (Premium)

Model Name

Smart Collection Bin

Dimensions

1403 × 1278 × 2710 (mm)

Size

Weight: 500 (kg) / Volume: 560 (L)

Power Consumption

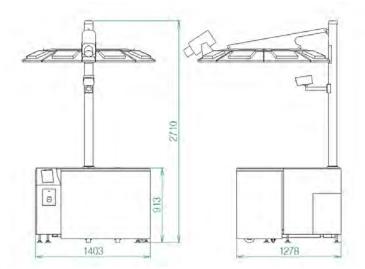
Day: 0.25 (Kw) / Night: 0.46 (Kw)

Power Generation

Solar: 0.08 (Kw)

Functions

- Al recognition and QR code recognition
- 10.1-inch touch panel
- Automatic opening and closing of the input slot
- Dual automatic opening and closing of the waste collection compartmen
- Indirect lighting, security lights, and high-beam lights activated at night
- Finger pinch prevention sensors on the input slot and collection compartment



Eco-Friendly Smart Collection Bin (Standard)

Model Name

Al Smart GPB 1000 (Standard)

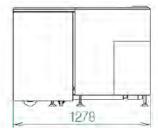
Dimensions

1403 × 1278 × 2710 (mm)

Size

Weight: 500 (kg) Volume: 560 (L)

1403



Functions

- Al recognition and QR code recognition
- 10.1-inch touch panel
- Automatic opening and closing of the input slot
- Dual automatic opening and closing of the waste collection compartment
- Finger pinch prevention sensors on the input slot and collection compartment

Product List



ENplus(Hi-1015)

An all-in-one system integrating renewable energy and grid power with ESS for efficient energy storage and use.



ENplus(HiD - 5050)

A system that stores renewable energy, grid power, EV, etc in an ESS for Home ESS. It can also be used as standalone portable power.



Energy Harvesting

A technology that harvests energy from the environment to measure and transmit temperature and humidity without external power, batteries, or cables.



Energy-Welfare System

A system that integrates various energy sources to optimize consumption and improve efficiency, monitoring and managing power usage and supply in real-time for more efficient ESS operation.



CO:DEEP

CO:DEEP, a practical Al-SW programming learning tool, is an all-in-one system which users can experience programming, or write statements on their own.



CO:DEEP Charger

Easy storage & Easy charging Prevents product damage Ease of maintenance



Eco-friendly Smart Collection Box

A system that uses AI to recognize and collect only certified standard waste bags

Patent & Certification

Patent



Copyright



Certification

한국경동인증원

한국경충인증원





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