Instruction Manual

Smart Recycling Bin

Model: 11625

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1. Product Contents (Pre-Assembled)

- Smart recycling bin with 3 compartments
- Motorised automatic lid
- Wooden structure with matte finish
- HC-SR04 sensors for object detection
- Camera connected to Raspberry Pi (Model B 2018)
- Servo motors (MG995 and SG90) for movement
- ESP8266 microcontroller with integrated Wi-Fi
- Internal connections with protected wiring
- TXB0108 level shifter for safe communication

2. General Operation

- The recycling bin detects the presence of an object using ultrasonic sensors. As soon as the camera captures the object, the Raspberry Pi analyses the image using the AI model.

- If the detection confidence is equal to or greater than 80%, it sends the material type to the Arduino via serial communication. The Arduino then activates the servo motors.

- The information is also sent by the ESP8266 to a website where the user can monitor the data in real time: material type, fill level percentage of each compartment, and last update.

3. Usage Guidelines

⚠️ Never expose to water. The wood is not waterproof and the electrical system may be damaged.

⛔ Do not use outdoors. For dry indoor environments only.

⚡ Keep away from wet sockets or heat sources.

🚫 Do not force the lids or the chute. Movements are automated.

🔧 Do not open the structure unless necessary. Any maintenance must be carried out with the device unplugged.

4. Safety Instructions

⚠️ Keep out of reach of children. Contains moving parts and electrical wiring.

🔴 Never insert metallic, liquid, or toxic objects. Only dry recyclable materials are allowed.

🗑️ Do not place excessive weight on the recycling bin. The structure is sturdy but not designed to support loads over 10 kg.

🔌 Always unplug the device before any technical inspection.

5. Technical Support and Maintenance

- Regularly check the internal cables, especially if the structure has been moved.

- The servo motors should be tested monthly. If they produce unusual noise or excessive vibration, they may need to be replaced.

- The camera should always be kept clean. Use a dry microfibre cloth to clean the lens.

6. Device Registration on the Website

To link the Smart Recycling Bin to your personal account and enable real-time monitoring of the equipment status, it is necessary to register the device through the online platform.

6.1 Account Creation

Go to the official website at ecoponto-inteligente.xyz and complete the account creation form with the following required information:

Identification Code

Format: EC-XXXX

This code is provided with the device and is unique and non-transferable. It ensures the correct association between the physical device and the registered user.

6.1 Account Creation

- **Username**

Choose a unique identifier. It may contain letters, numbers, and basic characters.

- **Email Address**

Enter a valid email address. It will be used for notifications, password recovery, and possible technical contact.

- **Password**

Set a secure password, preferably with a minimum of 8 characters, including uppercase and lowercase letters, numbers, and symbols.

- **Confirm Password**

Repeat the password for verification.

- **Terms and Conditions**

Accepting the platform's Terms and Conditions of use is mandatory to complete the registration.

After filling in all fields, click the **CREATE ACCOUNT** button. The system will automatically validate the identification code and, if valid, associate the device with the newly created account.

If the entered code is incorrect or has already been registered, an error message will be displayed. Please verify the number and try again.

6.2 Accessing the User Dashboard

After successfully completing the registration, you will be automatically redirected to the User Dashboard, where you can check the status of your Smart Recycling Bin in real time.

The dashboard is presented in a clear and intuitive way, with the following main sections:

☐ Summary Indicators (Top of the Dashboard)

At the top of the screen, three informative rectangles are visible with the following data:

Average Fill Level

Average fill percentage of all compartments.

- Fullest Container
  - Indicates the type of waste with the highest accumulated volume (e.g., "Paper and Cardboard – 82%").

- Last Update
  - Date and time of the device's last automatic synchronization with the online platform.

These indicators are updated in real time whenever the recycling bin performs a new reading.

6.2 Accessing the User Dashboard

- Just below, there are three horizontal progress bars, each corresponding to one of the waste types:
  - ♻️ Plastic and Metal
  - 🍾 Glass
  - 📄 Paper and Cardboard

Each bar shows the current fill percentage, updated whenever the system detects a new deposit.

The colours of the bars change according to the level:

- **Green: 60%**
- **Yellow: 85%**
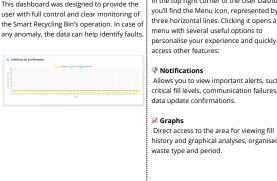- **Red: 95%**

📈 Fill History

At the bottom of the dashboard, a time-based graph is available showing the fill history in percentage.

This graph allows analysis of the daily or weekly evolution of the volume of waste deposited in each compartment.

Features:

- Filtering by waste type
- Viewing by days, weeks, or months

This dashboard was designed to provide the user with full control and clear monitoring of the Smart Recycling Bin's operation. In case of any anomaly, the data can help identify faults.

6.3 Navigation Menu

In the top right corner of the User Dashboard, you'll find the Menu icon, represented by three horizontal lines. Clicking it opens a side menu with several useful options to personalise your experience and quickly access other features:

🔔 Notifications
Allows you to view important alerts, such as critical fill levels, communication failures, or data update confirmations.

📈 Graphs
Direct access to the area for viewing fill history and graphical analyses, organised by waste type and period.

👤 User

Displays the profile of the currently logged-in account. Here you can change the username, email, password, and other personal settings.

📱 Install myEcoponto

Button dedicated to installing the web-app version of the system on your mobile device or desktop. Allows quick access via a shortcut on the home screen.

🌙 Dark Mode

Toggles between light and dark interface modes, ideal for night use or low-light environments.

🚪 Logout

Ends the current session and redirects to the login screen.

This structure makes the dashboard intuitive and functional, with easy access to all important areas. It is recommended to explore each option to ensure full use of the system.

7. Warranty

- Manufacturing Warranty: 3 years

Coverage:
- Defects in the wooden structure (cracks or assembly faults)
- Problems with sensors, camera, or microcontrollers
- Internal wiring or motors with manufacturing defects

Exclusions:
- Damage caused by water, humidity, or sun exposure
- Misuse, improper opening, or unauthorized modifications
- Damage caused by attempts to power with incorrect voltages

8. Contacts

✉ Email: suporte@ecoponto-inteligente.xyz

🌐 Website: ecoponto-inteligente.xyz/support

📍 Technical Headquarters: Largo Nossa do Desterro, 3140-909 Montemor-o-Velho

📱 WhatsApp for Technical Support: +351 912 345 678

🕐 Support Hours: Monday to Friday, 9 a.m. to 6 p.m.