ADLINK
LEADING EDGE COMPUTING



Flake Sorting

Edge AI Platform for Advanced Sorting System Developers

Accelerate AI Model Deployment and Field Integration with ADLINK's Scalable Edge Architecture

Solution Brief

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1 Executive Summary

In today's push toward a more circular plastic economy, improving the quality and efficiency of recycling has become a major industry priority. While traditional reverse vending machines (RVMs) collect containers effectively, they lack the ability to handle complex, contaminated waste streams—a critical bottleneck in plastic recycling.

As sensor and AI-driven sorting technologies evolve, the concept of integrating flake sorting closer to the collection point—empowered by edge computing—is emerging as a transformative solution. Flake sorting involves high-precision separation of plastic flakes by polymer type (e.g., PET, PP, PE), color, and transparency, critical for producing food-grade and cosmetic-grade recyclates.

An Edge Computing for recycling solution deploys lightweight hardware equipped with AI sensors and real-time processing at the point of collection. It maximizes intelligent sorting, automated identification, and instant data communication—paving the way for higher-value resource recovery and more resilient recycling ecosystems.



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2 Industry Challenge

Flake sorting plays a critical role in modern recycling systems. System developers are under increasing pressure to achieve higher material purity, greater throughput, and enhanced automation—while maintaining operational efficiency and cost control. To meet these demands, smarter and more flexible solutions that support custom AI models and edge deployment are essential.

As a leading provider of edge AI platforms, ADLINK Technology offers a broad portfolio of rugged hardware solutions with versatile sensor and I/O compatibility. These platforms empower system developers to build intelligent, scalable, and high-performance recycling systems.

3 ADLINK Edge AI Platforms: Designed for Developers

Flake sorting systems demand real-time, high-precision processing to accurately classify and eject plastic flakes based on material, color, and contamination. To meet the growing expectations for purity, throughput, and automation, system developers require a robust computing platform that delivers edge AI performance, sensor integration, and industrial-grade reliability. Below are the key computing requirements that must be addressed:



AI Inference Performance

Running multiple deep learning models (e.g., material detection, color classification, contamination detection) in parallel requires GPU or NPU acceleration.

Low-Latency Processing

To synchronize detection with air-jet ejection mechanisms, inference and control response must occur within 100 milliseconds or less.

Multi-Sensor Integration

The platform must support various imaging and sensing modalities—GigE Vision, USB3, MIPI, and potentially NIR or hyperspectral sensors—for comprehensive flake analysis.

Deterministic I/O Control

Real-time control of air valves, diverters, conveyors, and encoders via GPIO, Modbus, or EtherCAT is essential for precise ejection timing.

Modular and Scalable Design

The system should allow for compute, I/O, and GPU scalability to fit different machine sizes, from compact RVMs to full-scale industrial sorters.

Industrial Durability

A fanless, ruggedized chassis designed to operate in dusty, high-vibration, and temperature-variable environments is critical for 24/7 uptime in recycling facilities.

Remote Manageability

Edge devices should have remote management capabilities, such as updates, monitoring, and alerts, to simplify large-scale maintenance and field deployment.

Framework Compatibility

Support for ONNX, PyTorch, TensorRT, OpenVINO, and other standard AI toolkits ensures easy integration of custom sorting models.

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4 What Make ADLINK Platforms Valuable to You



Seamless AI Model Deployment

- Support for major AI frameworks including ONNX, PyTorch, TensorRT, and OpenVINO.
- Containerized architecture allows plug-and-play deployment of your proprietary detection/ classification models.
- Optimized for real-time inference with low latency—even in multi-camera, high-throughput environments.

Built for Easy System Integration

- Out-of-the-box support for GigE Vision, USB3, MIPI cameras·
- Encoder sync, GPIO, Modbus, and industrial protocol I/O for tight control loop integration with actuators, air jets, and diverters.
- Designed for fast time-to-integration into your robotic, optical, or conveyor-based sorting architecture.

Ready for Harsh Environments

- Fanless, ruggedized design built for dust, vibration, and temperature extremes.
- Available in Jetson-based and x86+GPU configurations, enabling performance scalability from prototype to production.

Remote Management at Scale

- ADLINK EdgeGo provides comprehensive remote device management, including package and script deployment, real-time CPU, disk, and memory monitoring, and proactive alerts — ensuring secure and reliable edge operations with advanced protection measures.
- Ideal for scaling across distributed recycling plants or smart MRF (Materials Recovery Facility) operations.

5 ADLINK Edge AI Solutions to Meet Flake Sorting Demands

We offer a comprehensive portfolio of industrial-grade AI platforms that directly address the performance, integration, and environmental challenges of flake sorting systems.
Below are the recommended solutions by application scale:



Compact Edge AI Platform

DLAP-411-Orin Supreme

- High AI Performance: Delivers 60–275 TOPS of edge AI inference in a fanless, power-efficient Jetson Orin design.
- Compact & Embedded Ready: Optimized for compact and embedded systems with reliable thermal efficiency.
- Versatile Connectivity: Supports multiple camera inputs (MIPI, USB3) and industrial I/O (GPIO, CAN, UART) for diverse applications.

learn more



Embedded Edge AI Platform

DLAP-5200 Series

- Modular Performance: Features x86 computing with optional discrete GPUs (MXM) for high-throughput, multi-channel sorting.
- Rich Connectivity: Provides extensive PoE, USB, and digital I/O for simultaneous image acquisition and real-time actuation.
- Scalable & Rugged Design: Built for centralized sorting facilities, ensuring reliability and easy system expansion.

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Remote Management Software

EdgeGO

- Stay informed by real-time alerts.
- Execute scripts and deploy packages with just a few clicks.
- Customizable visual dashboard at a glance.
- Protect user devices with advanced edge security measures.

learn more



Where We Fit In Your Ecosystem

innovation—We're not replacing your we're enabling it. ADLINK provides the compute foundation that lets you focus on what you do best: developing advanced AI models, optical systems, and sorting logic. With our platforms, you accelerate time-to-market, reduce integration friction, and scale with confidence.

Let's Build Smarter, Together

We're working with sorting innovators to deliver faster, more modular, and field-ready AI-enabled systems. If you're developing the next-gen sorting solutions—plastic, metals, e-waste, construction materials—we'd love to be your compute partner at the edge.

> Contact us to explore a proof-of-concept or request platform documentation.

Head Office

ADLINK Technology, Inc.

No. 66, Huaya 1st Road, Guishan District
Taoyuan City 333411, Taiwan
Tel: +886-3-216-5088

www.adlinktech.com

Worldwide Offices

Ampro ADLINK Technology, Inc.

6450 Via Del Oro, San Jose, CA 95119-1208, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-600-1189
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.

上海市浦东新区张江高科技园区芳春路300号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5192-3588
Email: market@adlinktech.com

ADLINK Technology Beijing

北京市海淀区上地东路1号盈创动力大厦E座801室 (100085)
Rm. 801, Power Creative E, No. 1 Shang Di East Rd. Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8626
Email: market@adlinktech.com

ADLINK Technology Shenzhen

深圳市南山区科技园南区高新南七道数字技术园A1栋2楼C区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7 High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

ADLINK Technology Singapore Pte Ltd.

1008 Toa Payoh North, 07-17/18 Singapore 318996
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte Ltd. (Indian Liaison Office)

#50-56, First Floor, Spearhead Towers
Margosa Main Road (between 16th/17th Cross)
Malleswaram, Bangalore - 560 055, India
Tel: +91-80-42246107, +91-80-23464606
Fax: +91-80-23464606
Email: india@adlinktech.com

ADLINK Technology Japan Corporation

〒101-0045 東京都千代田区神田鍛冶町3-7-4 ユニゾ神田鍛冶町三丁目ビル4F
Unizo Kanda Kaji-cho 3 Chome Bldg. 4F,
3-7-4 Kanda Kajicho, Chiyoda-ku,
Tokyo 101-0045, Japan
Tel: +81-3-5209-6001
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

ADLINK Technology Korea Ltd.

경기도 용인시 수지구 신수로 767 A동 1503호 (동천동, 분당수지유타워) (우) 16827
A-1503, U-TOWER, 767 Sinsu-ro, Suji-gu, Yongin-si, Gyeonggi-do, Republic of Korea, 16827
Toll Free:+82-80-800-0585
Tel: +82-31-786-0585
Fax: +82-31-786-0583
Email: korea@adlinktech.com

ADLINK Technology, Inc. (Israel Liaison Office)

MIXER Herzliya (Building B, 9 Floor)
3 Arik Einstein st., Zip code 4610301
Herzliya, Israel, P.O.Box - 351
Tel: +972-54-632-5251
Fax: +972-77-208-0230
Email: israel@adlinktech.com

ADLINK Technology GmbH

Hans-Thoma-Straße 11
D-68163 Mannheim, Germany
Tel: +49 621 43214-0
Fax: +49 621 43214-30
Email: germany@adlinktech.com

Ulrichsbergerstraße 17
D-94469 Deggendorf, Germany
Tel: +49 991 290 94–10
Fax: +49 991 290 94–29
Email: germany@adlinktech.com

ADLINK Technology, Inc. (French Liaison Office)

Bâtiment Thalès - Parc des Algorithmes,
Route de l'Orme des Merisiers,
91190 SAINT AUBIN, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology, Inc. (UK Liaison Office)

First Floor West Exeter House,
Chichester fields Business Park Tangmere,
West Sussex, PO20 2FU, United Kingdom
Tel:+44-1243-859677
Email: uk@adlinktech.com

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