ADLINK
LEADING EDGE COMPUTING



# ADLINK EtherCAT Multi-axis Control Enables Simultaneous Pick and Place on Conveyor Belt During Picking, Sorting, and Consolidation

Use Case

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## Overview

Consumers want faster delivery. So retailers promise same-day and next-day delivery, then expect logistics companies to honor their commitment to help them fulfill those orders on time. However, rapidly increasing demand is taxing logistics providers' ability to successfully deliver orders as promised. Increasing service capacity can be tricky, so while labor costs continue to rise and labor supply remains unpredictable, many logistics companies are looking to increase and speed up automation to keep ahead.

The Third-Party Logistics (3PL) market was valued at around USD 1trillion in 2020 and is expected to reach more than USD 1.75 trillion by 2026, representing 8% growth during the period (2021-2026). For warehouse operators to capitalize on this growth and maintain their competitive edge, they have to get packages through their conveyor systems quicker and more reliably than ever before.

## Highly Variable Warehouse Automation Systems Require Precise Synchronization Not Available With CANopen Solutions

Belt conveyors are highly customizable systems configured to accommodate the unique design and layout requirements of different applications. The conveyor systems setup can employ different routes, lengths, paths, and a selection of peripheral devices. Along their journey to delivery, packages pass many stages, including photo interrupters, pick and place, electronic scales that measure the package weight, and cameras that scan barcodes for product traceability. And the complexity is rising.

Existing CANopen solutions are struggling to keep up, and as conveyor systems become increasingly automated, with more peripherals and a greater number of axes and I/O, they need a different technology that provides more precise synchronization to keep packages moving at speed. CANopen is limited to 1 Mb/s data bandwidth, which caps its expansion capabilities as conveyor peripherals integrate more complex functionality and accelerate package processing speeds.

## ADLINK EtherCAT Solutions Provide Speed and Synchronization to Accelerate Highly Automated Warehouse Conveyor System

ADLINK's EtherCAT solution has enabled the warehouse to achieve a 20% increase in productivity by speeding up the pick and place sorting procedure on the moving conveyor belt. EtherCAT offers accuracy, capacity, flexibility, and range of slaves modules needed for future-ready conveyor belt systems.

**Higher accuracy** is achieved through 64-axis synchronized control. This level of precision becomes increasingly critical as conveyor speeds increase and multiple stages in the conveyor system must stay precisely in sync. For pick and place systems, this is of particular importance, because of the combination of movement and measurement followed by the picking action and placement while still on the move, a combination of multiple processes.

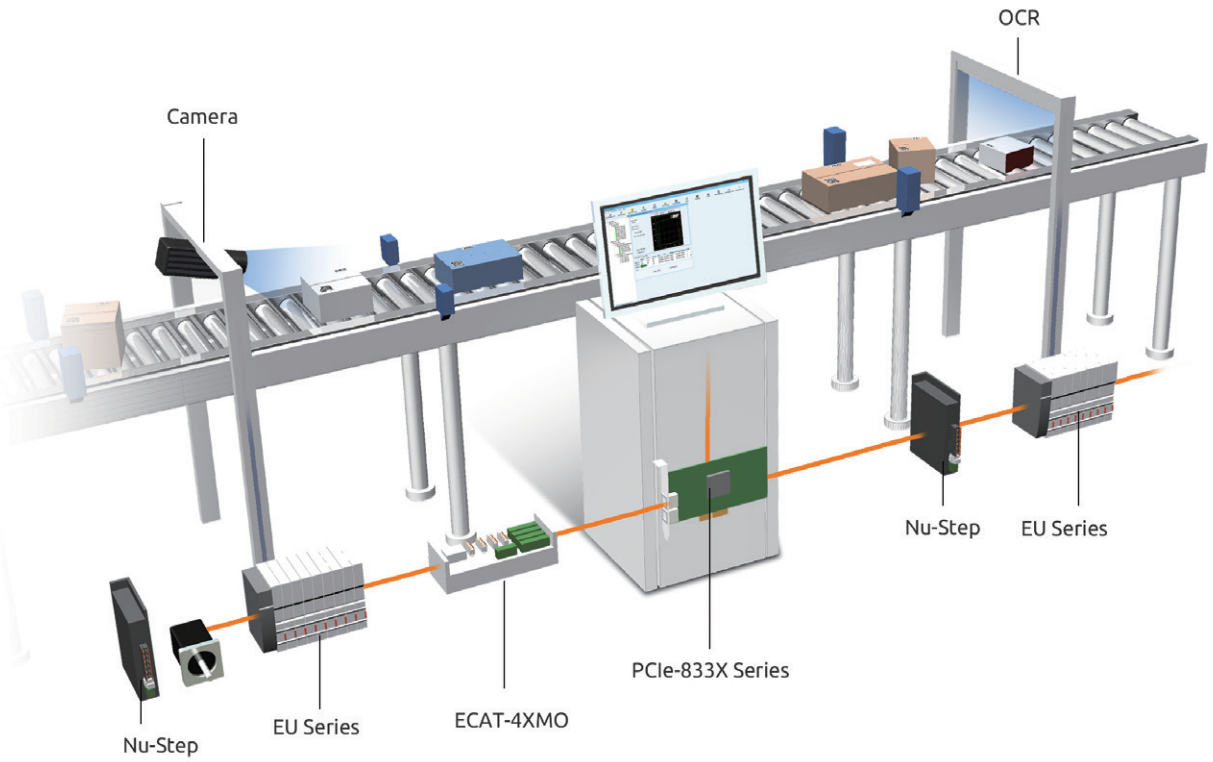
**Increased capacity** is possible due to the responsiveness and speed of EtherCAT. With higher speed data transmission and lower latency, production speed increases are possible while maintaining quality. With 10,000 DIO and 2,500 AIO, a 20% boost in production efficiency is easily achievable.



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**Flexible capacity** is a result of the simplicity of the EtherCAT network infrastructure. Utilizing the data and physical layers of the IEEE 802.3 standard and a simple ring topology, each slave in the system has an Ethernet input and output for connectivity. Adding new stages to the conveyor system is almost as simple as setting it up and plugging it in.

**Wide range of slave modules** allows precise part selection to suit cost and performance criteria. With conveyor systems ranging in size and complexity, and different parts of the system requiring parts of differing specifications, it is important that motors and other I/Os are selected to match the intended use, thereby building an efficient operating environment while lowering procurement costs.






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## ADLINK EtherCAT Solution

ADLINK's EtherCAT solutions offer superior performance hardware and software to provide warehouse logistics conveyor belt setups with the high-speed synchronized control systems they need for fast, accurate, and efficient package delivery. The PCIe-833X EtherCAT master controller, ECAT-4XMO 4-channel motion control high-speed trigger EtherCAT bridge, and EU series EtherCAT slave system and modules were used for the warehouse conveyor system.

### PCIe-833X EtherCAT Master Controller

PCI Express® x1 EtherCAT motion controller, with Maximum64-axis motion and 10,000 I/O point control, Minimum250μs cycle times, various EtherCAT slave options, and a dedicated emergency stop input. Application-ready function library for easy motion and I/O control included. ADLINK MotionCreatorPro 2 for Microsoft® Windows allows complete EtherCAT motion and I/O configuration and function evaluation.

### ECAT-4XMO 4-Ch Motion Control and High-Speed Trigger EtherCAT Bridge

Four-channel EtherCAT slave module with high-speed position comparison trigger and encoder re-drive function. Supports 4-axis motion control with bridge function between EtherCAT and non-EtherCAT. Advanced motion control functions include linear, step, servo, direct drive, and AC motors, ideal for various automation applications.

### EU Series EtherCAT Slave System and Modules

Modules with state-of-the-art modular construction suitable for small local applications and expansive distributed platforms. The EU system incorporates and controls nearly any type of I/O device. Operates from 0°C to 55°C, is fully compliant with the EN 61131-2 standard for shock and vibration and EN 61000-6 for heavy industrial EMC protection, and includes an emissions certificate.

## ADLINK—The Automation Expert

ADLINK Technology Inc., with years of market-proven expertise in measurement and automation technologies, provides a leading range of industrial automation products empowering motion control, machine vision, data acquisition, I/O control, and intelligent computing platforms. Superior domain know-how and field experience help us meet and exceed customer needs, with a wealth of highly integrated automation solutions enabling real-time I/O and motion control, backed up with reliable one-stop service. ADLINK consistently delivers value by overcoming a wide variety of industrial challenges, with proven platforms optimizing operations, driven by a commitment to long-term sustainability and intelligent manufacturing design.



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