

ADVANTECH

Automation Control HMI Solutions Guide

Advantech HMIs: Reliable & Stable
Control for Field-Side Solutions



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WHY Advantech?

From Field-Side Monitoring to Real-Time Control — A Stable & High-Expanded HMI Platform

- **Integrated Control Platform**
Software-defined control + visualization + compute in one HMI — reducing panel space, wiring complexity, and total cost while eliminating a separate PLC.
- **Modular Architecture**
Compute-box + display decoupled design supports multiple screen sizes and allows fast field upgrade / swap without cabinet redesign.
- **Deterministic Performance**
Intel® Core™ / Atom® platforms with real-time optimized BIOS deliver stable cycle times and time-critical control responsiveness.
- **Scalable Expansion**
From iDoor I/O to dual PCIe — enabling motion, vision inspection, AI inference and GPU acceleration on the same HMI platform.

Warehouse Eco-System



Target Customer:
Global SI & Local SI & ISV



HMI Driven Real Time Robot Control for High Volume STOW Operations



Overview

A large North America ecommerce fulfillment center required a real time STOW solution for high density tote loading. Robotic arms needed to continuously pick and place mixed SKUs into destination totes with deterministic timing. The customer deployed CODESYS for real time motion sequencing and required higher processing headroom to maintain stable cycle time under non stop workloads. The HMI served as the field side interface to the backend WES system and provided direct operator interaction without interrupting automation flow.

Challenges / Requirements:

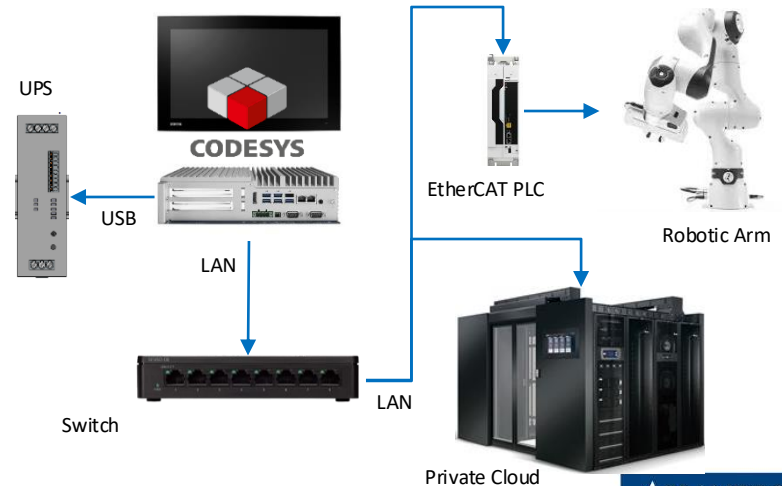
- Real time motion control and deterministic response for continuous robot STOW cycles
- CODESYS runtime support for multi axis motion planning and execution
- Stable timing behavior with very low jitter during robot pick and place operations
- High SKU variation and dynamic tote destination routing
- Unified control logic across multiple stations

Solution:

Advantech HMI was implemented together with a high performance compute module that executes CODESYS runtime and controls motion logic at the field level. The HMI provides station status, workflow interaction, and operator visualization while the compute module performs deterministic robot control. This architecture enables one standardized software image across different display sizes which simplifies deployment and reduces engineering effort during system expansion.

Benefits:

- Stable real time control with predictable cycle time and lower motion jitter
- Socket type CPU architecture provides performance headroom for CODESYS based real time workloads
- Fanless design with PCIe LAN card improves system reliability and provides sufficient network bandwidth for continuous robot communication
- Scalable platform that supports future station expansion and more complex robot tasks



Advantech Industrial HMI Products in Automation Control



TPC-520

TPC-B610

TPC-B620

FPM-S18W/S21W

FPM-D15T/D21W-HE

Intel 13th Gen Core i5/i7 Deca-Core

Intel 10th Gen Core i CPU Socket (LGA1200)

Intel BTL-S Core i CPU Socket (LGA1200)

18.5/21.5 inch Slim Bezel Display Modules

Intel Elkhart Lake Atom/Celeron Quad-Core

- Module front panel range from 12.1 ~ 23.8"
- 10 point PCAP touch screen with IP66 waterproof
- LAN, POE, Isolated serial, DIO via iDoor module
- Support TypeC with USB3.2 DP 1.4a
- Wide operating temperature range -20 ~ 60 °C

- Module front panel range from 15 ~ 23.8"
- 10 point PCAP touch screen with IP66 waterproof
- Supports Expansion via 1 x PCIe x16, 1 x PCIe x4/PCI, 1 x mPCIe
- Supports Storage via 2 x 2.5" HDD/SSD (RAID 0/1), 2 x M.2 (2242/2280)
- Wide operating temperature range -10 ~ 50 °C

- Module front panel range from 15 ~ 23.8"
- 10 point PCAP touch screen with IP66 waterproof
- Supports Expansion via 1 x PCIe x16, 1 x PCIe x4/PCIx2, 1 x m.2
- Supports Storage via 2 x M.2 SATA (2280), 1 x M.2 NVMe (2280), Optional 1 x 2.5" SSD
- Wide operating temperature range -10 ~ 55 °C

- Ultra Slim front bezel and status LED indicators
- Easy installation with Build-in panel mount kit
- 10 point PCAP touch screen with IP66 waterproof
- Wide operating temperature range -10 ~ 60 °C

- Sunlight readable with >1000 cd/m² luminance
- 10 point PCAP touch screen with IP66 waterproof
- Wide operating temperature range -20 ~ 60 °C