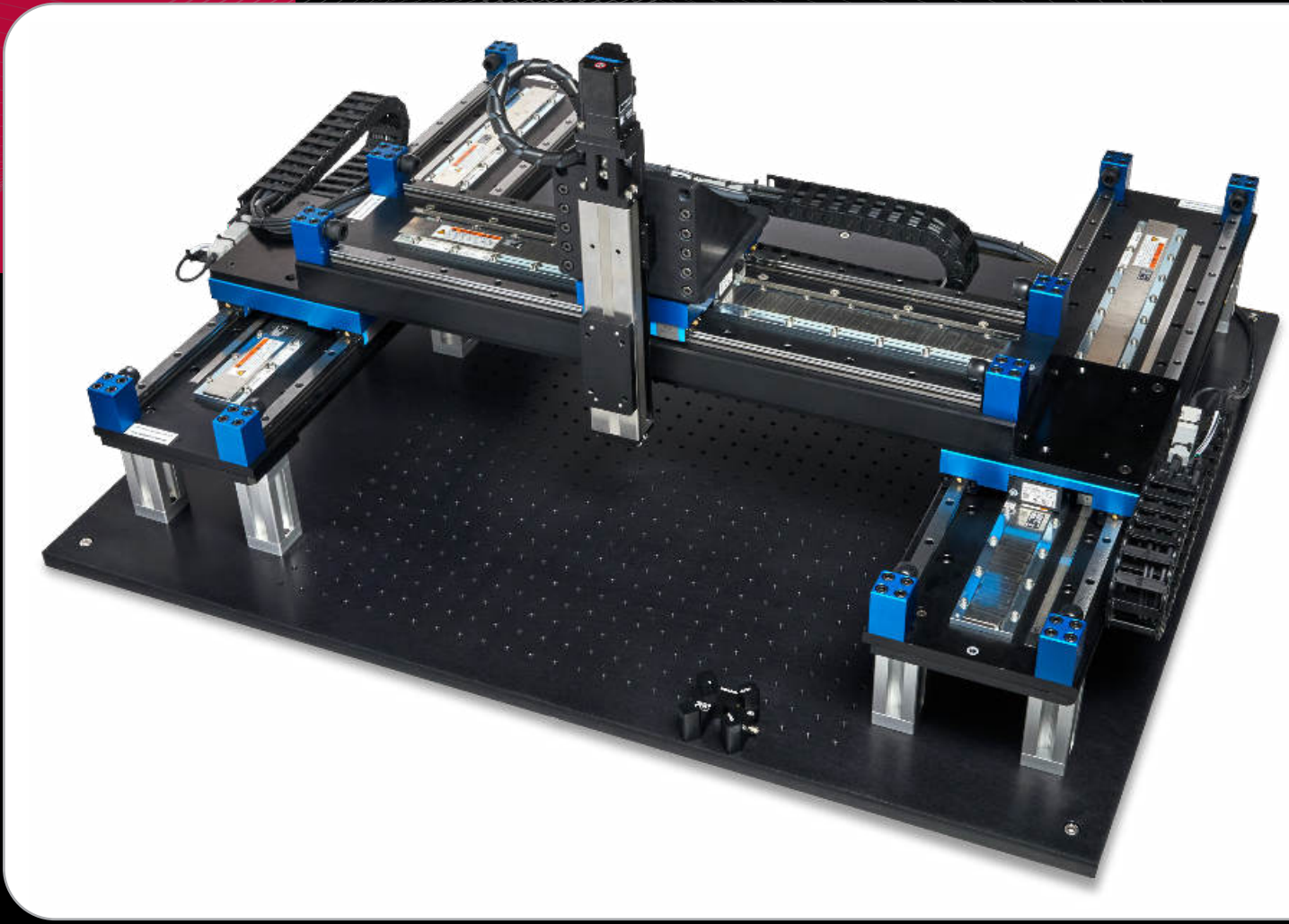
FISHMAN®
Dispensing Innovation®

OTS Automation Platform



High Performance Module

The OTS Automation Platform from Fishman® Corporation is designed for system integrators seeking a high precision X, Y and Z Cartesian module to provide a starting point for a turnkey custom automation system. The OTS Automation Platform achieves the highest performance of any Cartesian gantry while reducing delivery times when developing custom automation systems for a wide range of industries and applications.

OTS Automation Platform Advantages

Exceptional Axis Repeatability

Repeatability on the X and Y is ±2 µm, where on competing platforms, ±20-60 µm is the norm, OTS delivers an increase of performance by 10-30 fold.

Rapid Motion Robot

It can achieve an operational speed of 4 m/s (~157.5 inch/s) in the XY plane.

Precise Alignment

The total alignment of the gantry (of all 3 axis) is only 12.7 µm (0.0005 inch).

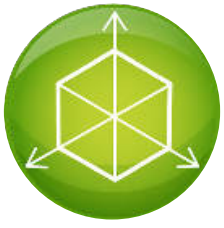
Easy to Integrate

The OTS Automation Platform is a custom automation starter platform for a complete machine. The OTS starter gantry allows an integration engineer to design and build a high-performance custom automation platform with ease.

A complete platform, the OTS, includes everything a system integrator would want when creating a custom automation platform for a valued customer.

- Full X,Y, Z motion programming
- A main, state-of-art, IC9226 industrial controller, which includes a PLC , and can be communicated via:
  - » Digital I/O
  - » EtherCAT
  - » Profinet
  - » EtherNET/IP
  - » OPC UA
  - » Modbus TCP

The OTS is equipped with a dedicated Keyence safety controller and an advanced power management system designed for rigorous thermal management. This hardware combination ensures robust thermal protection and includes built-in overvoltage protection (OVP) to safeguard the system against input voltage fluctuations and high-demand cycles. Furthermore, the system accelerates development by offering deployment-ready, turnkey motion primitives. Built on an extensible architecture, the control environment is optimized for rapid custom logic integration, allowing system integrators to easily tailor the platform to their specific application requirements.



3-Axis Precision Robot

The 3-axis Cartesian gantry dispensing robot features a **direct-drive linear motor X-axis, dual direct-drive linear motor Y/Y' axes,** and a **precision ball screw Z-axis,** achieving **±2 µm positioning repeatability in the XY plane** and **±3 µm on the Z-axis.**

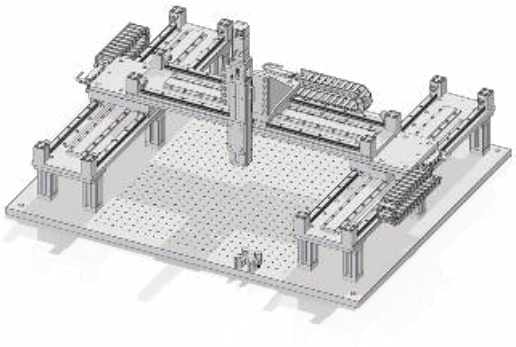
System Architecture and Technical Rational

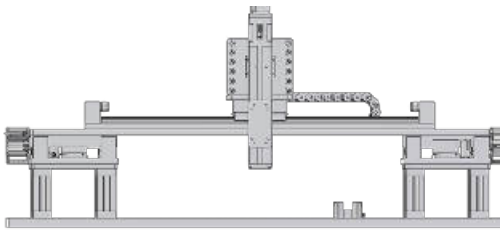
Motion Platform: Direct-Drive Linear Motors (X, Y/Y') + Ball Screw (Z)

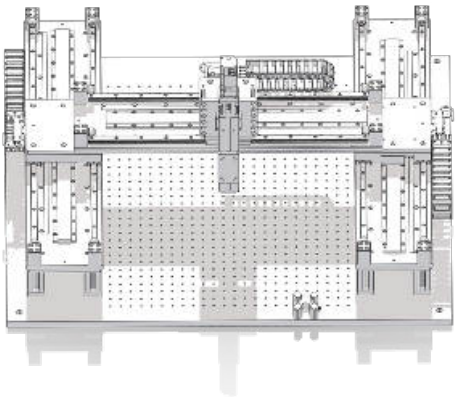
The OTS Platform employs **magnetic-force direct-drive linear motors** on all primary translation axes. The **X-axis** (ST2F-A1A0745-B1LN) provides 525 mm of travel with a 135 N peak force. The **Y-axis uses a dual-motor configuration (Y and Y'),** each driven by an ST2F-A2A0935-A1LN unit (270 N each, **540 N combined**) across 555 mm of travel. The dual Y/Y' configuration drives the X bridge simultaneously from both sides along parallel rails. Any differential in motor position between Y and Y'—even at the sub-10 µm level—rotates the X bridge about the Z-axis, introducing a yaw error that maps directly to XY positional deviation at the dispense head. Y/Y' synchronization is implemented as a **master-slave position-following architecture:** the Y motor operates as the position master, with Y' commanded to continuously track the master encoder output. This eliminates differential position error between the two rails as the primary source of X-bridge yaw, while keeping servo tuning and fault diagnostics straightforward in a production environment. Each linear motor additionally incorporates dual guide rails, providing inherent pitch and roll stiffness at the individual carriage level without requiring active correction.

Direct-drive architecture is the key enabler of XY precision. By eliminating the mechanical transmission chain between motor and carriage—no ballscrew, no coupling, no gearbox—all XY backlash, wear, and mechanical compliance are removed from the error budget. Positioning repeatability of **±2 µm** is limited by encoder resolution and servo bandwidth, not mechanical hysteresis. For manufacturing processes requiring precision dispensing, where a lateral positional error of even 10 µm can cause the end-effector to miss the target (cavity) entirely on tightly toleranced components, this is a non-negotiable architectural choice.

The **Z-axis** employs a KR2602A-0160-P0-10AQ precision ball screw actuator (2 mm lead, ≤3 µm backlash) driven by a SGMXJ-A5AWA61A2 servo motor. A ball screw is used on the Z-axis for its gravity-resistant nature. The screw's mechanical advantage (1,576N theoretical maximum force from 0.159Nm rated torque) provides stable motion without the need to constantly power the driving motor. The 165 mm Z-stroke accommodates body height variation and clearance above the manufactured part entry without manual re-setup across part changeovers.







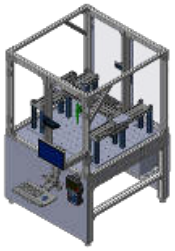
OTS Automation Platform

OTS Automation Platform Includes:

- Part Number: H110001
- X, Y, Z Axes for Gantry
- Electrical Cabinet

OTS Automation Options:

- Contact for Quotation
- Enclosure



Technical Specifications

MOTION PERFORMANCE	
X-AXIS TRAVEL	525 mm | ST2F-A1A0745-B1LN magnetic-force linear motor
Y-AXIS TRAVEL	555 mm | Dual Y/Y′ configuration: ST2F-A2A0935-A1LN × 2
Z-AXIS TRAVEL	165 mm | KR2602A-0160-P0-10AQ precision ball screw actuator
X-AXIS DRIVE TYPE	Magnetic-force direct-drive linear motor — no mechanical transmission
Y/Y′ DRIVE TYPE	Dual magnetic-force direct-drive linear motors — master-slave synchronized, dual guide rails per motor
Z DRIVE TYPE	Precision ball screw, 2 mm lead, ≤3 µm backlash
XY POSITIONING REPEATABILITY	±2 µm
Z POSITIONING REPEATABILITY	±3 µm
MAXIMUM SPEED—X/Y AXES	4,000 mm/s
MAXIMUM SPEED—Z AXES	200 mm/s
X-AXIS PEAK FORCE	135 N (ST2F-A1A0745-B1LN)
Y/Y′ COMBINED PEAK FORCE	540 N (2 × 270 N, ST2F-A2A0935-A1LN per motor)
Z-AXIS MAXIMUM FORCE (THEORETICAL)	~1,576 N (ball screw, 2 mm lead / 0.159 Nm rated torque)
Z-AXIS SAFE PAYLOAD	3 kg

ELECTRICAL	
OPERATING VOLTAGE	200-220 V AC / 3-Phase / 60 Hz / 20 A
EMERGENCY STOP	Hardware E-Stop, CE Compliant

To learn more about how the OTS Automation Platform can help you more quickly build a better automation solution for your customers, call Dominik Nasilowski, Head of Robotics Engineering, at (508) 686.5082.