

BENEFITS

- » Reduces workplace injuries by automating a dangerous, manual task
- » Requires minimal tending, allowing personnel to be utilized elsewhere for more efficient use of labor
- » Increases throughput and offers the potential for 24/7 operation.
- » Reduces bottlenecks with a sustained, repeatable and consistent cycle time
- » Ensures precise, even cardboard placement on every load for professional, uniform packaging and brand identification
- » Automatically adjusts cardboard placement on skewed loads (+/- one inch) for consistent quality and appearance
- » Protects itself from crashes by detecting stack position and alerting operators to skewed load conditions
- » Minimizes downtime by monitoring supply levels and automatically reloading the staple gun magazine
- » Can be configured to accommodate multiple cardboard sizes (optional)
- » Remote Access Monitoring (optional) reduces the need for onsite visits to perform diagnostics and troubleshooting

APPLICATIONS

- » Stacks of OSB or Plywood
- » Square edge or tongue
- » Stack heights of 24" to 48"
- » Stack lengths of 8' to 9'

FLEXIBLE AUTOMATED SOLUTIONS

PRE-TEC's Robotic Cardboard Applicator automatically singulates, applies and secures cardboard protector sheets to the sides of OSB or plywood panel stacks. It has been designed for stand-alone use or it can be placed inline with PRE-TEC's Robotic Spray Booth and Stencil / Stripper System

PRECISE, REPEATABLE SHEET PLACEMENT

A six-axis, industrial robotic arm utilizes multiple end-of-arm tools to perform a variety of tasks such as singulating cardboard, folding and stapling. The flexibility and accuracy of the robotic arm allows programming of precise staple patterns and consistent cardboard placement for repeatable results on every load.

The Control system uses a Programmable Logic Controller (PLC) combined with photo eyes and other devices to determine the height, length and width of the stack as well as its location on the conveyor line. This allows the robot to properly position each cardboard sheet on the load for repeatable results every time. Even if the load is not correctly aligned, the robotic arm can adjust for this variance to ensure straight, precise sheet placement.

Advanced load sensing technology protects against crashes—if a load is out of alignment by +/- one inch, an alarm will sound, alerting

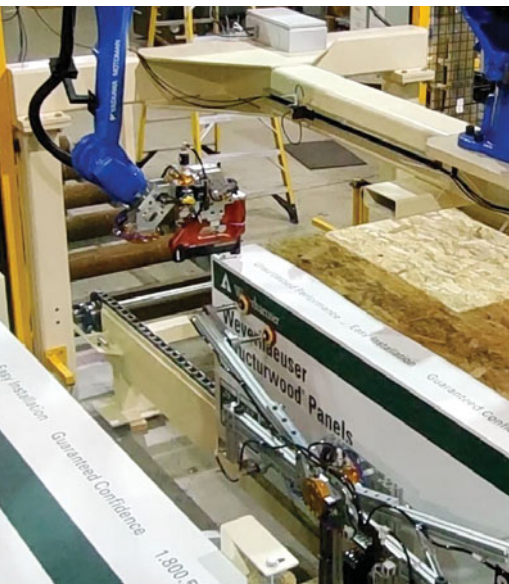
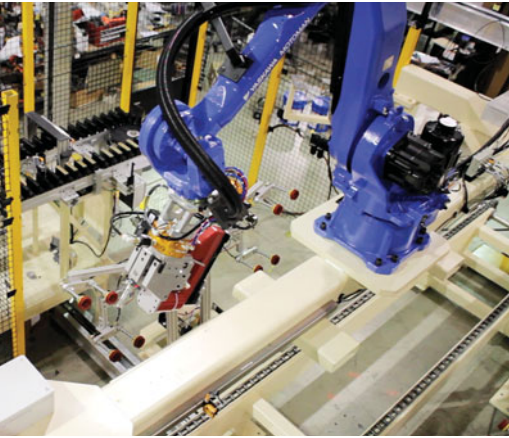
the operator, and the load will stop to prevent damage to the system.

INTELLIGENT SUPPLY MONITORING

The Control system actively monitors cardboard and staple supply levels. The system has two cardboard magazines—when one is empty, the second one is shuttled in to replace it, and the empty one can be resupplied without interrupting production. When the staple gun runs low on staples, it is automatically reloaded, and the staple supply system alerts the operator to the low staple supply condition.

When a low staple magazine condition is indicated, the robotic arm moves the staple gun to the automatic staple loading system. The staple gun can be reloaded between bundles, enabling consistent cycle times and minimizing disruptions. A spare stapling assembly is included with the system as a backup in the event a problem is detected. Constant monitoring by the Control system will instruct the robotic arm to automatically change tools to ensure seamless, uninterrupted load processing.

If the staple levels in the automatic staple loading system run low, the operator is notified in advance so it can be resupplied for continuous system operation.



COMPONENT OUTLINE

- » Six-axis Robotic Arm and Controller
- » Programmable Logic Controller (PLC)
- » Structural Steel Framework
- » Two (2) Cardboard Magazines
- » Cardboard Magazine Shuttle
- » Two (2) Pneumatic End-of-Arm Vacuum Tools
- » Two (2) Pneumatic Docking/Deployment Fixtures
- » Two (2) Pneumatic End-of-Arm Staple Gun Assemblies
- » Automatic Staple Loading System
- » Safety System
 - › Robotics Industries Association (RIA) 15.06 Standard Compliant
 - › Disconnects for lockout and tag-out protocols
 - › Personnel interlock switches on access doors that activate a safety stop command if opened during operation
- » Fully Integrated Conveyor
 - › Variable Frequency Drives
 - › Standard conveyor length is 21'
 - › Mechanical Drives
 - › Roller Chain: 81X
 - › Accommodates conveyor speeds up to 80 lineal feet per minute
- » Full Complement of Sensors
- » Lockable Air Supply Valves
- » Two (2) Operation Manuals

STANDARD COMPONENTS

- » **Mechanical Drives:** Sew EuroDrive
- » **Motors:** Baldor, Toshiba or Weg
- » **Bearings:** Dodge, SKF or Link-belt
- » **Pressure Switches:** Hydac or IFM
- » **Pneumatics:** Numatics
- » **Fluid Regulators:** ARO
- » **Communications Protocol:** Ethernet I/P
- » **HMI:** PanelView +7 1000
- » **PLC:** Allen Bradley Compact Logix
- » **Enclosures:** Hoffman or Rittal
- » **Staples Crown x 5/8" Legs**

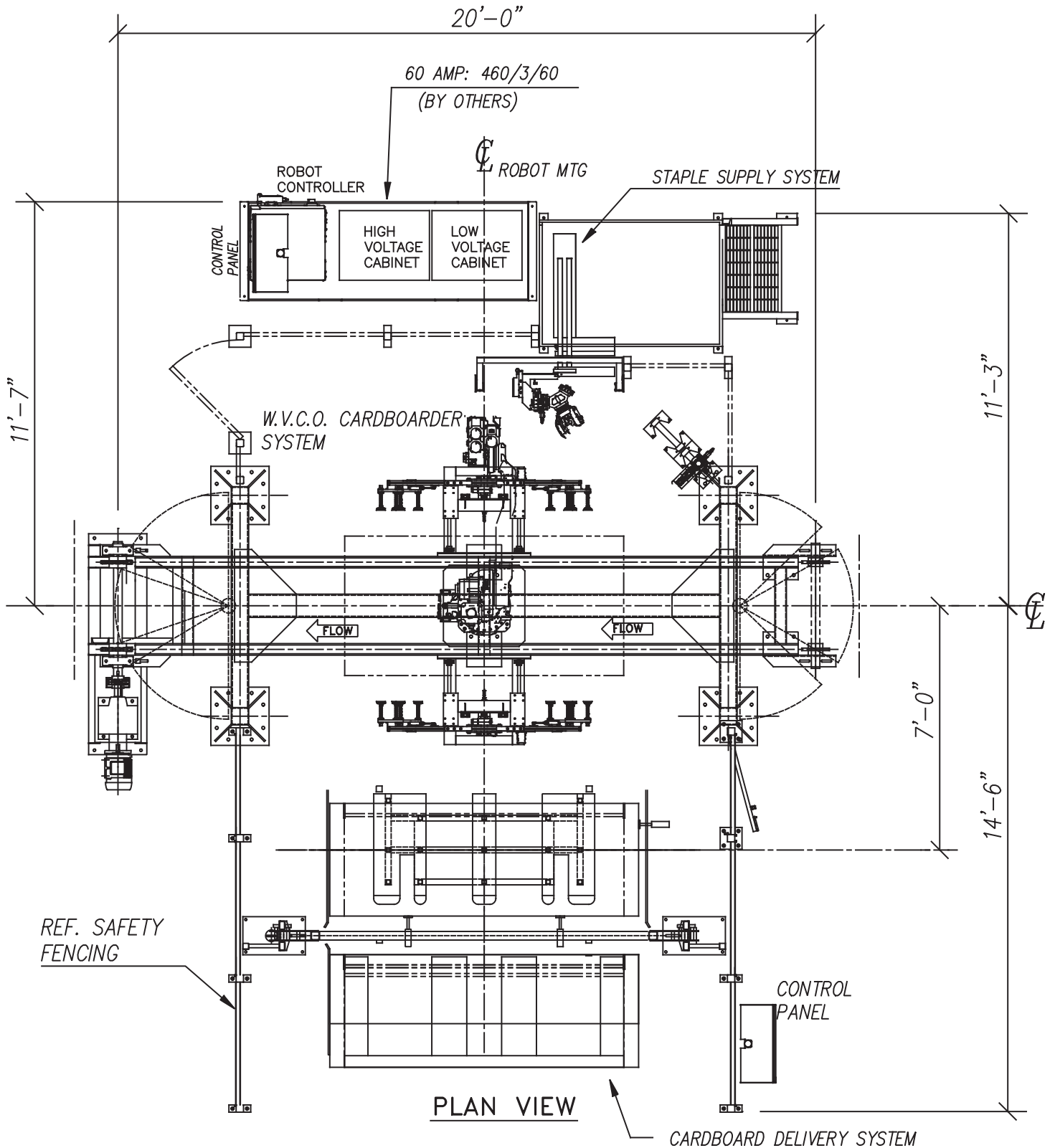
OPTIONS

- » Remote Access Monitoring (recommended)
- » Extended Conveyor Lengths
- » Three-chain Conveyors
- » Allen Bradley Control Logix PLC
- » Accommodation of multiple cardboard sizes

REMOTE ACCESS MONITORING

Get help when you need it! PRE-TEC can provide remote assistance as an optional addition to the Robotic Cardboard Applicator system. The Remote Access Monitoring hardware enables PRE-TEC employees to help mill personnel with troubleshooting and diagnostics without requiring a costly, onsite visit. Remote Access Monitoring connects to the system's main PLC via Ethernet. Mill personnel activate the Remote Access Monitoring system through a mobile connection (a mobile access signal at the mill is required).

ROBOTIC CARDBOARD APPLICATOR LAYOUT



SPECIFICATIONS

System Height (varies by pass line height):

Approximately 14'

System Length: 21' – 30' (depending

on options)

Conveyor Length (end-to-end): 21'

System Width: 26' (excluding controls cabinet)

System Weight (including conveyor): 9,500 lbs.

Power Requirements (one drop):

USA: 480VAC, 3PH, 60 amp,

120v single phase

Canada: 575VAC, 3PH, 50 amp,

120v single phase

Grounding Requirements:

Ground Rod(s) 100 Ohms or less

Foundation Requirements:

Concrete slab floor, 6" – 8" thick

Process Air (dry, clean):

11 scfm @ 70 psi Duty Cycle 30%

Anchoring Requirements:

Epoxy Anchors: (32) 3/4" x 7 1/2" long,

(6) 5/8" x 6" long, (4) 1/2" x 6" long

PRE-TEC is the largest custom robotic solution provider on the West Coast. Whether you are considering automation to increase efficiency, ensure manufacturing safety or improve quality, PRE-TEC has the expertise to make your next project a success.



SEQUENCE OF OPERATION

1. The height of the load is measured upstream from the Cardboard Applicator station.
 - a. Sensors confirm the load is correctly centered and justified and confirms the bundle is center justified to within +/- one inch
 - b. If a misaligned stack is detected, the system sounds an alarm and stops the load.
2. The robot picks up the first sheet of cardboard and places it in a docking fixture.
3. The load continues to enter the Cardboard Applicator station.
4. The robot picks up the second sheet of cardboard and places it in a docking fixture.
5. Once the stack has stopped in position, the docking fixtures press and hold the cardboard sheets in place on each side against the load.
6. The robot picks up the staple gun assembly and uses it to fold the flaps on the cardboard sheets and staple them in place.
 - a. The side flaps are folded and stapled first then the top flaps are folded and stapled.
7. When the stapling cycle is complete, the docking fixtures retract from the load. It is released to move downstream.

CYCLE TIMES

The Cardboard Applicator can process a 4' x 8' stack in approximately 60 seconds. The cycle time clock begins when the stack is fully on the infeed conveyor. The cycle time is completed once the entirety of the load is on the outfeed conveyor.

Factors that can affect cycle time include:

- » Infeed/outfeed conveyor speed
- » Multitasking of robot and conveyor control systems via PLC
- » Integration optimization

Call 800.205.9826 for an engineering review of your project.
Or visit pre-tec.com to see demonstration videos, project history and more.