Packaging Made Easy

Solutions for Packaging Applications

Control Techniques®
Leroy-Somer®
Through the strength and synergy of over 60 companies, Emerson is a $20 billion corporation (NYSE: EMR), bringing innovation and engineering expertise together to solve the needs of machine builders, OEM’s and other businesses worldwide. By partnering with us, our customers are able to deliver solutions—top quality products, service and support, to their customers in an expanding global market.

**Control Techniques** is the world leader in the design and manufacture of “intelligent” drive systems with over 50 Drive Application and Engineering Centers worldwide to support an installed base of over two million AC, DC and servo drives.

**Emerson** and its **Motor** businesses have been building motors for over 100 years. **Control Techniques Dynamics** and **Leroy-Somer** add unparalleled value and performance with leading edge servo and specialty motor technology.

**Numatics Incorporated** has redefined pneumatic and motion control technology with its innovative technologies.

**Branson** is the plastics joining technology leader providing world-class products and a broad knowledge base for support for these applications.

**Emerson Process Management** is the leader in process management serving a variety of industry with control technologies such as DeltaV and PlantWeb.
Emerson’s packaging machine solutions

See how you can leverage the broad range of packaging machine technologies that the Emerson businesses can provide and are easily accepted by your customers. Packaging machines are inherently motion centric and Control Techniques “Motion Made Easy™” makes servo motion easy.

Automation Control

- Reduce time to market with “Motion Made Easy™” servos and easy HMI programming
- Smaller machine footprint with very compact drives and integrated drive, PLC and motion control
- Easy line integration with on-board Ethernet and Plantweb connectivity, options for all major fieldbuses

Drives and Motors

- Reduce machine costs with competitively priced AC general purpose drives
- Faster changeover and throughput with servo drives at stepper drive prices
- Scalable servomotors with matched servo drives make material changeover easy
- Enhanced safety with torque limiting and safe off technology

Motion Components

- Material changeover made easy with broad mechanical motion solutions
- Reduce lead-time and faster changeover with fieldbus enabled valve blocks
- Innovative and flexible material solutions with ultrasonic welding
Solving packaging applications from the simple to the complex

- Labeler
- Thermo-Form-Fill-Seal
- Flexographic Color Printer
- Vertical Form-Fill-Seal

www.emersonindustrial.com/automation
Tube Decorator

Thermoforming Trim Press

Bundler/Wrapper
Application Overview

Vertical Form Fill Seal (VFFS) machines are compact, flexible packaging machines used in a wide variety of products from powdered foods to potting soils and liquids such as water and lotions. Packages take the form of pillow packs to four sided sealed pouches offering consumers attractive and convenient containers.

Key functions are tension control, registration mark capture, synchronized motion, and real-time sealing control.

Application Requirements

Control
- Synchronized axis
- High speed product registration
- Uniform seal and cut
- Flexible package size/type

Connectivity
- Simple product change and adjustment
- Versatile communications across hardware
- Help

System Costs
- Reduce hardware costs
- Reduce development time

Control Techniques’ Solutions

Servo Drives and Motors, VFDs, and HMIs
- Programmable electronic camming
- Standard drive to drive cable
- Registration capture to 1µsec.
- Blended moves
- Position mode to torque mode during operation
- Create/load recipes from CTVue HMI
Vertical Form Fill & Seal Solutions

Control Techniques’ Performance Advantages
Built-in Functions
- High speed registration
- Blended moves
- Position to torque mode during operation

Advanced Control and Tuning
- Electronic cams
- Real time programs
- Real time timers for precise control

Software
- PowerTools Pro
- Free software
- Intuitive

Distributed Control
- Programmable drives
- Drive to Drive communications
- Ethernet or RS485

World Class Products & Support
- Worldwide Application & Field Service Network
- 24/7 support line 1-800-893-2321

Compact Servo Drives
AC Drives
Intelligent Servo Drives
Auger Filling

Application Overview

There are several different type of dry filling machines used in manufacturing today. Dry fillers are designed to measure and dispense the exact amount of product into a container quickly and efficiently. Auger fillers do this by rotating an auger to meter out the appropriate amount of material into the package.

As material costs rise, manufacturers are increasingly paying more attention to minimizing product waste, however overfilling packages is often used as a safe guard against under filling. To prevent over or under filling, in-line check weighers and advanced move profiles can be used. Flexible acceleration profiles also give the added benefits of decreased product degradation and lower mechanical stress.

Application Requirements

Control & Connectivity

- Accurate and repeatable fill levels
- Minimize product degradation
- Quick product change over to fill different size packages
- Reduction in product voids; consistent product transfer
- High quality products to reduce machine down time
- Connectivity to both I/O and supervisory control networks

Control Techniques Solutions

Servo Drives and Motors, VFD’s, and HMIs

- Analog and fieldbus communications allows for easy connections to check weighers and SCADA equipment.
- Jerk free acceleration and deceleration ramps
- Multiple drive networking for distributed control reducing PLC requirements.
- CT-Vue HMI enables trending, logging, and alarming of critical weight data.
Auger Filling Solutions

Control Techniques Performance Advantages

Analog or Fieldbus Communications
- Built-in communications and analog controls make setup quick and easy
- Direct mapping of fieldbus or analog signals to product dispense ratios for quick product fill level adjustments
- Wide range of communication options: DeviceNet, ProfiBus, Modbus TCP/IP, EtherNet/IP, and Modbus RTU
- Real-time programs for fast data transfers

Jerk Free Acceleration
- User defined acceleration curves provide unlimited profile flexibility
- Standard acceleration types include linear, and four variations of S-Curve
- Cubic Spline CAMS guarantee jerk free movements

CTVue Sequential Control and Data Acquisition
- Trending screens allow visual monitoring of weights
- CTVue alarming alerts users to over or under weight conditions
- Data-logging features can store machine trend data to simple CSV files, easy transferred to SCADA systems

World Class Products & Support
- Worldwide Application & Field Service Network
- 24/7 support line 1-800-893-2321
Application Overview

A form fill and seal system implements several technologies. Typical system may have three stations to Form, Fill and Seal the package. In the first station, the package is erected while in motion and synchronized to conveyor, the second station, package is filled by weight when conveyor is in dwell state, and the final station, the package is closed and sealed in motion that is also perfectly synchronized to conveyor for a uniform seal. Remote I/O can be implemented for upstream and/or down stream interlocking and remote control of system.

Application Requirements

Control
- Synchronized motion
- High speed gross weighing
- Remote I/O

Protection
- Quick product change over
- Speed matching

System Cost
- Minimize system components
- Reduce development time

Control Techniques’ Solutions

Servo Drives and Motors, VFDs, and HMIs
- Programmable electronic cam tables
- Up to 250 µsec. update rate
- Registration / limit distance
- Recipe creation / cam selection
- Master encoder input / output
- Built-in automation controller capabilities
Horizontal Form Fill & Seal Solutions

Control Techniques’ Performance Advantages

Built-in Functions

- Camming
- 380 function blocks
- PLC Open function blocks
- CT-Net network
- CT-Sync

Advanced Control

- Field installable coprocessor
- Deterministic network
- Remote I/O
- Multi-Task programs

Software

- SyPT Pro
- Network and automation software in one package
- 61131-3 like programming language

World Class Products & Support

- Worldwide Application & Field Service Network
- 24/7 support line 1-800-893-2321

Control Techniques  7078 Shady Oak Road, Eden Prairie, MN 55344 Tel. 800-893-2321  www.controltechniques.com  PN:s-horzffs-08
Application Overview

Traditionally fill and displacement rates were accomplished using mechanical cams.

Our Control Techniques' servo solution makes synchronizing multiple axes easier and cost effective. These electronically programmable servo systems can be reconfigured on-the-fly for rapid product change overs. And requires little or no operator involvement.

Application Requirements

Control

- Reduced development time
- Synchronize axes
- Minimize mechanical adjustments

Connectivity

- Communications to SCADA systems
- Enhanced product diagnostics

System Costs

- Adjustable cams
- Quick product change over
- Change cams on the fly

Control Techniques’ Solutions

Servo Drives and Motors, VFDs, and HMs

- Electronic Cams can be modified during production
- Virtual Master improves synchronization
- Intuitive programming with PowerTools Pro
- Drive to Drive networking
- Distributed control - no PLC required
- Plantweb™ connectivity capabilities
- Open architecture
Liquid Filling Solutions

Control Techniques' Performance Advantages

Built-in Functions
- Cubic spline cams make setup and programming of complex motion profiles easy.
- Real-time programs allow the user the ability to switch between cam profiles on the fly, with smooth transitions.
- Cam import function allow you to import csv files to populate the Cam tables.

Advanced Control and Tuning
- The advanced networking capabilities of our systems allow connectivity to virtually any manufacturer’s equipment. In addition, our Emerson Plantweb™ connectivity capabilities allows the complete process to be managed and monitored from a single operator station.
- Dynamic table data can be exported from the drive for data logging and diagnostics.

PowerTools Pro Software
- Our drag and drop, fill in the blank commissioning tool is intuitive and easy to use. Allowing drive configuration and programming to happen quickly.

Distributed Control
- Modbus Master allows for Drive to Drive networking for simple coordination, eliminating the need for complex PLC’s or motion controllers.
- Eliminate the need for costly PLCs
- Easily add networked I/O

World Class Products & Support
- Worldwide Application & Field Service Network
- 24/7 support line 1-800-893-2321
Automatic Palletizers

Application Overview

Floor or low level palletizers are designed to take in single packaged products, either full cases or bags, and arrange them in a single layer on a pallet. High level palletizers collate full cases of product to form a complete pallet layer and then the layer is transferred onto the top of the pallet. Generally, these palletizers are designed to support only one type of package product, but in today’s world, where lean packaging is a requirement, these palletizers must be versatile to handle a variety of product shapes and sizes.

Additionally, end users are increasingly paying more attention to life cycle costs associated with plant floor space, air consumption and machine flexibility. Servo controlled palletizers provide several benefits to greatly enhance the palletizer performance, increase flexibility, and can save in energy and maintenance costs.

Application Requirements

Lean manufacturing
- Increased product throughput
- Reduced machine footprint
- Support of multiple product sizes and weights
- Automatic product changeover

Green manufacturing
- Reduce noise
- Eliminate the need for compressed air
- No hydraulic fluids
- High efficiency VFD’s and Servos reduce energy consumption

Control Techniques Solutions

Servo Drives and Motors, VFD’s, and HMI’s
- Predefined motion functions make it easy to eliminate mechanical and pneumatic functions
- Advanced control and tuning algorithms compensates for load changes
- Rapid setup with intuitive software
- Multiple drive networking for distributed control
- User selectable pack patterns for quick product changeover
Automatic Palletizer Solutions

Control Techniques Performance Advantages

Built-in Motion Functions
- Seamless transitions from position or velocity modes to torque mode
- Adjustable acceleration and quick settling times increase throughput
- Program fill patterns
- Event handling for high speed I/O transfers
- On board Programmable Limit Switches

Advanced Control and Tuning
- State space control algorithm helps eliminate overshoot
- Load based tuning
- High bandwidth control loop
- Stable over wide range of inertia mismatches

Distributed Control
- Eliminate or reduce the need for costly PLC’s
- Easily add I/O for total machine control
- Fast data transfers between Servo Drives, VFD’s and HMI
- Low cost and easy to implement

Scalable Functionality
- Base drive for velocity / torque mode applications
- Indexing drive for precise positioning
- Programming drive for user flexibility
- Communications for both I/O and supervisory networks

World Class Products & Support
- Worldwide Application & Field Service Network
- 24/7 support line 1-800-893-2321

Control Techniques
7078 Shady Oak Road, Eden Prairie, MN 55344 Tel. 800-893-2321 www.controltechniques.com PN:s-pallet-08

www.emersonindustrial.com/automation
Pressure Sensitive Labeling

Application Overview

Pressure sensitive labelers are very flexible machines and are used in a variety of labeling applications and industries such as food and beverage, pharmaceutical, and many more. Their main purpose is to apply preprinted/pre-glued labels to products as they move at a continuous rate past the label head. The label applicator must accelerate to match velocity to the incoming product and then decelerate to a stop. The label applicator cycle time depends on the label size, the speed of the product, and the ability of the servo controller to match the product line speed without overshoot.

Application Requirements

Control & Connectivity
- Accurate label placement throughout speed range
- Speeds up to 1200 labels per minute
- Label Jog functions
- Dimple free labeling
- Ability to add promotional inserts
- Simplified control architecture

Protection
- Missing label detection and error handling
- Advanced machine diagnostics

System Costs
- Low cost high performance solution
- Short development times
- Low maintenance

Control Techniques’ Solutions

Servo Drives and Motors, VFDs, and HMIs
- Build in Labeling Functions
- Advanced Control and Tuning Algorithms
- Rapid setup with intuitive software
- Multiple drive networking for distributed control
- Low inertia servo motors
- High quality and reliability
Pressure Sensitive Labeling Solutions

Control Techniques’ Performance Advantages

Built-in Labeling Functions
- High speed (1us) capture for accurate product detection at any speed
- Product queuing for higher throughput
- Synchronized Jog for manual label feed
- Event handling for high speed I/O transfers
- On board Programmable Limit Switches
- Virtual Master for smooth machine operation

Advanced Control and Tuning
- State space control algorithm helps eliminate overshoot
- Adjustable gear ratio eliminate dimples
- High bandwidth control loop
- Stable over wide range of inertia mismatches

Motion Made Easy Software
- Drag and Drop programming and setup
- Ready made software templates
- Advanced diagnostics and fault processing
- High speed graphing
- Free software

Distributed Control
- Eliminate or reduce the needs for costly PLCs
- Easily add I/O for total machine control
- Fast data transfers between Servo Drives, VFDs and HMI
- Low cost and easy to implement

World Class Products & Support
- Worldwide Application & Field Service Network
- 24/7 support line 1-800-893-2321

Control Techniques
7078 Shady Oak Road, Eden Prairie, MN 55344  Tel. 800-893-2321  www.controltechniques.com  PN:s-label-08
Application Overview

Shrink wrappers are used in many packaging plants to overwrap heat shrink film over a tray of product. After the product passes through a heat tunnel, the film adheres to itself and seals the product to the tray for shipping. The system uses a conveyor to feed the film under an incoming tray then the film and the tray advance in a synchronized motion. After the tray passes the conveyor opening, the film is cut and the wand is used to wrap the loose film over and then under the tray. The wand, conveyor and film must all be synchronized with each other to maintain proper film placement. The film can be clear or printed. If printed film is used, proper registration must be maintained to keep the print matched to the product.

Application Requirements

- Quick setup for film changeover
- Variable tray length
- Variable speed
- Initial film placement accuracy
- Synchronized motion of film and/or wand to the tray
- Accurate film registration
- E-STOP recovery routine

Control Techniques Solutions

**Servo Drives, Motor, VFDs, HMI**

- Synchronized Jog, Home and Indexing
- Synchronized electronic camming
- Connectivity to any PLC communications protocol
- Easy mapping of HMI with drive parameters
- Low and medium inertia motors to match the application requirements
- Application templates to jump start the programming process
Shrink Wrap Solutions

Control Techniques’ Performance Advantages

**Built-In Synchronization**
- On-board master encoder input
- Electronic cams allow any motion profile to be easily configured
- Cam data can be manipulated on-the-fly for rapid product adjustments
- All motion objects can be real-time or synchronized to the master

**Advanced Features**
- High speed input capture for accurate placement
- Software Queue object performs intelligent shift register operation making programming of difficult tasks much easier
- Virtual Master allows multiple axes to synchronize to a perfect master signal
- Cam-based ESTOP recovery, allows quick re-synchronizing the master and follower axes after an emergency stop

**Motion Made Easy™ software**
- No charge!
- Easy to use drag-and-drop programming software
- High speed 4-channel software oscilloscope
- Secure download protects intellectual property
- On line help

**World Class Products & Support**
- Worldwide application & field service network
- 24/7 support line: 1-800-893-2321

Cam profiles provide unlimited possibilities

Cams Made Easy!

CT Queue — The Intelligent Shift Register

 controlelectronics.com  PN:s-pallet-10

7078 Shady Oak Road, Eden Prairie, MN 55344  Tel. 800-893-2321  www.controltechniques.com  PN:s-pallet-10
Smart Belts

Application Overview
To reduce machine size and increase flexibility, designers are replacing fixed pitch flighted conveyors with smart belts. Smart belts are able to accurately position and place randomly spaced incoming product. Various product pitch and product length can be accommodated by adjustable servo system programs that can be reconfigured on-the-fly for rapid product changeovers requiring little or no operator involvement. Line synchronization also allows for the incoming product to change speed without any servo reprogramming needed.

Application Requirements

Control
- Increase through-put
- Easily adjust to product mix
- Accurately space incoming products
- Dynamically change acceleration profiles to eliminate product slippage

Connectivity
- Ability to network to virtually any PLC
- Stand alone network

System Costs
- Reduce multiple conveyors lanes required for differing products
- Single solution for product converging or diverting applications
- Low cost and simple to implement

Control Techniques’ Solutions

Servo Drives and Motors, VFDs, and HMI
- S-ramp for slip minimization
- Rapid change over
- Infinitely adjusts to changes in line speed
- Accurate product spacing
- Modbus Master controls VFD
Smart Belt Solutions

Control Techniques’ Performance Advantages

Built-in Functionality
- High speed capture (1us) for accurate product detection at any speed
- Queuing tool provides intelligent shift register capabilities
- Synchronized motion automatically adjusts to changes in master velocity
- Modbus/TCP and EtherNet/IP communications

Advanced Control and Tuning
- Numerator/denominator gear ratio eliminates fractional round off
- State Space tuning provides stability over wide range of load inertia

PowerTools Pro Software
- High speed oscilloscope graphing - powerful debug tools
- Advanced diagnostics and fault processing
- Upgrade software or firmware free from our web site

Distributed Control
- Multitasking processor - allows summation of multiple motion profiles
- Modbus Master - Easily add network I/O for total machine control
- Fast data transfers between Servo Drives, VFDs and HMI

World Class Products & Support
- Worldwide Application & Field Service Network
- 24/7 support line 1-800-893-2321

Control Techniques® 7078 Shady Oak Road, Eden Prairie, MN 55344 Tel. 800-893-2321 www.controltechniques.com  PN:s-smartbelt-08
Packaging machine builders face a variety of challenges, ranging from company and supplier issues to customer demands and competitive pressures. Emerson can help.

With our cost effective motion solutions you can count on:

- Shorter design times
- Quicker changeovers
- Handling broader material ranges
- Higher throughput
- Improved line integration
- Outstanding safety and quality
- The industry’s best pre- and post-sales support

We are packaging made easy.