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| Subject: Application Overview | Product: MP2000iec | Doc#: AO.MCD.05.112 |
| Title: Labeler | | |

Labeler

Application Overview

Today's labeling machines are typically used to apply one or more labels to a product while the product is moving past the labeling head. Compared to 'pause-stamp' methodology, labeling 'on-the-fly' dramatically improves production rates, but also results in specific challenges. Labels must be synchronized to the products at high speed without sacrificing placement accuracy and must be capable of handling irregular product spacing. Labeling machines are found in a broad range of industries including food and beverage, paper converting, pharmaceutical/medical, and consumer goods manufacturing.

Application Challenges

- Random Product In-feed – Controller must be able to account for product being fed at unpredictable intervals and automatically realign to place labels on the product in the correct location(s).
- Slippage Control – label must be traveling at the same speed as the product in order to place the label at the intended point without label slippage or wrinkling.
- Increased throughput – Higher productivity should result from the addition of this motion control solution due to higher speeds and reduced downtime. A labeler could be asked to reach speeds over 500 ft/min.
- Smooth Motion – The solution must yield smooth motion to reduce machine wear produced by jerky accelerations, resulting in increased machine life and lower maintenance (more uptime).

Yaskawa Products

| Product | Feature | Benefit |
|--|---|---|
| MP2000iec Motion Controllers with MotionWorks IEC Software | Electronic Camming with Registration | Synchronized position control with high-speed adjustment to maintain orientation of label to product. |
| | Global Programming Standard with MotionWorks IEC Software | Conformance to IEC61131-3 and PLCopen standards speeds the development and deployment process. |





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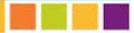
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| | High-performance distributed motion network | Easy quick-connect cable simplifies wiring, reduces installation time and enhances machine expansion through modularity. Supports servo axes, VFDs, and I/O devices. |
| SGDV Sigma-5 Servo Amplifiers | High speed latch input on servo amplifier | Direct high-speed capture of motor position for most accurate registration |
| | Advanced servo amplifier tuning | Out-of-the-box, automatic adaptive tuning requires no intervention or specific knowledge by the installer and speeds installation. Advanced Autotuning algorithms assist the engineer to correctly apply notch filters and anti-resonance filters to achieve the best response for the most demanding applications. |
| | 1.6 kHz frequency response | Highest performing amplifier in the industry for more responsive control. |
| | EN954-1, Category3, Stop0 input | Built-in safety circuit for regulatory compliance helps save panel space and component cost. |

Application Solution and Benefits

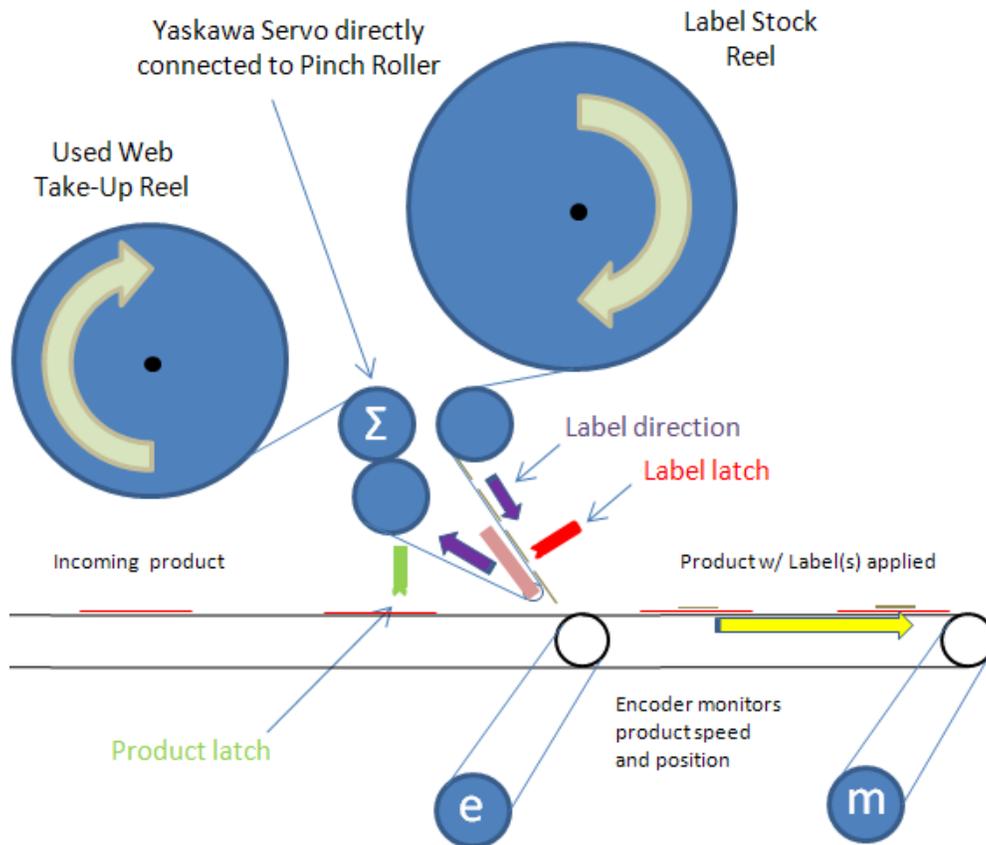
In this application, a roller or set of pinch rollers feeds labels through a labeling head and across a 'peel plate'. The product approaching a labeling head triggers a high speed sensor, which initiates the cam profile for label feed. The predefined profile causes the label to be pulled through the labeling head and applied to the product at a desired position. The servo must provide smooth acceleration to prevent tearing the label web and quick deceleration to stop between tightly placed labels without allowing slack to build in the web.

The control can compensate for variations in package separation and changes to conveyor speeds. In many cases, an incremental encoder is used to track the speed and position of the moving product once the leading edge has been latched. The encoder signal serves as a master for the labeler servo.





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To account for variance in label spacing on its carrier web, web stretch, or slippage at the feed rollers, a second high speed sensor is used to detect the actual label spacing. This latched position is used to adjust the final stopping point of the label. A consistent starting position is vitally important to final placement accuracy.

Incorporating the Yaskawa line of motion controllers, amplifiers and servomotors into labeling heads enables the industry's highest quality servo equipment to increase performance and reduce downtime. As a final benefit, Yaskawa motion controllers can be integrated into larger control systems through a variety of communication interfaces, such as Ethernet/IP and Ethernet Modbus/TCP, to provide ultimate connectivity and production monitoring capability.

