

Subject: Application Overview	Product: MotionWorks IEC	Doc#: AO.MCD.08.105
Title: Feed-to-Length		

Feed-to-Length

Application Overview

Feed-to-Length applications can be solved using Yaskawa Feed-to-Length Solution Package built around the Feed-to-Length function block. Applications which can benefit from this solution package are cut-to-length, vertical form fill and seal machines that do not require camming, paper cutting, wire cutting, stamping, and any other high speed application where moves are based on high speed registration. The advantages of using solution packages developed by Yaskawa are:

- Easy to startup application
- Programming time saved
- Tested code reduces risk
- Open ended for user to make custom changes

Application Challenges:

- The major challenges of a feed-to-length application are:
 1. Throughput
 2. Accuracy
 3. Safety
- Yaskawa's Feed-to-length Solution Package has been tested to optimize performance. High throughput is guaranteed. High accuracy is achieved using the high-speed latch input on the feed axis drive. Safety features like maximum number of missed parts, counters, and window for latching are incorporated in the feed-to-length function block. These features reduce risk to the user.

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Yaskawa Products:

Products	Product Features and Benefits
MotionWorks IEC with the MP2300Siec controller and Sigma-5 amplifiers	<ul style="list-style-type: none"> - IEC61131-3 and PLCopen standard compliant - Connectivity (upstream and downstream)
Feed-To-Length Solution Package	<ul style="list-style-type: none"> - Pre-tested code optimizes throughput and reduces risk to the user - Easy to install and start production

Application Details:

A feed-to-length application is one where a specific amount of material is to be fed a known distance and stopped, then followed by another process. There are no stipulations on the size and type of material, and no limitations on the following process once the material has been fed. Materials range from fine gauge wire, to slabs of steel, to sheets of plastic. Post-feed processes include cutting, welding, scoring, and stamping, to name a few. Common methods of feeding material in a feed-to-length application include the use of conveyors or pinch rolls. The walking beam approach is also used, while another approach uses a gripper to pull the product to the desired length.

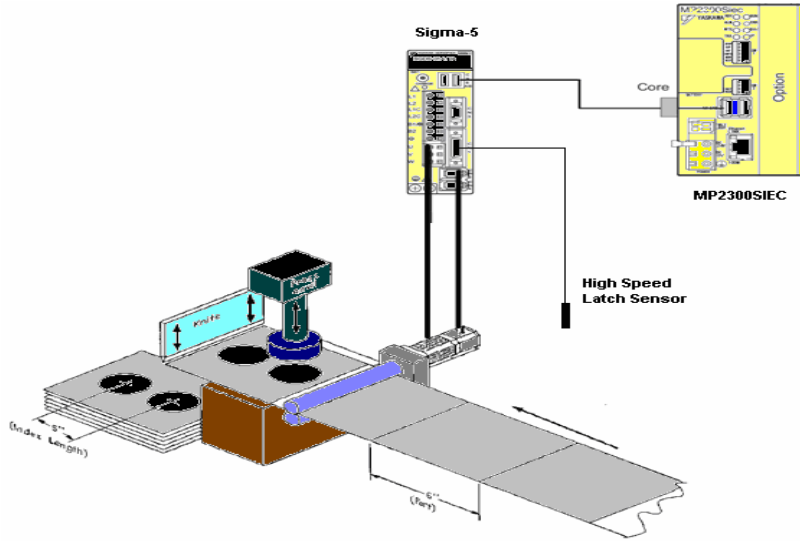


Figure 1: Feed-to-length application: Stamping

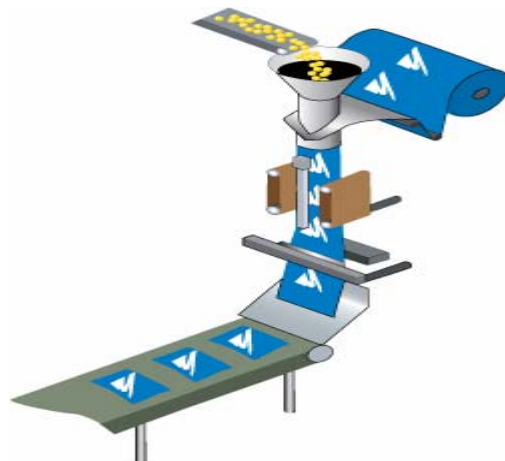


Figure 2: Feed-to-length Application: Vertical Form Fill and Seal

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Listed below are challenges faced in feed-to-length applications along with Yaskawa's solutions to deal with these challenges.

Challenge 1: Improve throughput without compromising precision

Solution 1: Optimized, pre-tested code using reliable Yaskawa motion control (MP2300SIEC) coupled with high performance servo drives (Sigma-5) lead to high production rates. Tight, high-speed motion control at controller and network level (MECHATROLINK-II) with easy and optimal tuning (advanced autotuning using SigmaWin+) helps the user maintain desired precision at high production rates.

8 " parts at 333 parts per minute with +/- 0.01 " accuracy

Challenge 2: Safety features to protect downstream operations

Solution 2: Pre-tested code forms the core of Yaskawa Solution packages. Safety features in the Feed-to-length function block like windowing, maximum missed part counter, minimum registration distance calculator, etc keep the application safe by not allowing unsafe motion.

Challenge 3: Connectivity to HMIs, PCs or upper level controllers

Solution 3: The MP2300Siec controller supports MODBUS TCP and Ethernet IP. Every controller is a MODBUS and Ethernet IP slave by default.