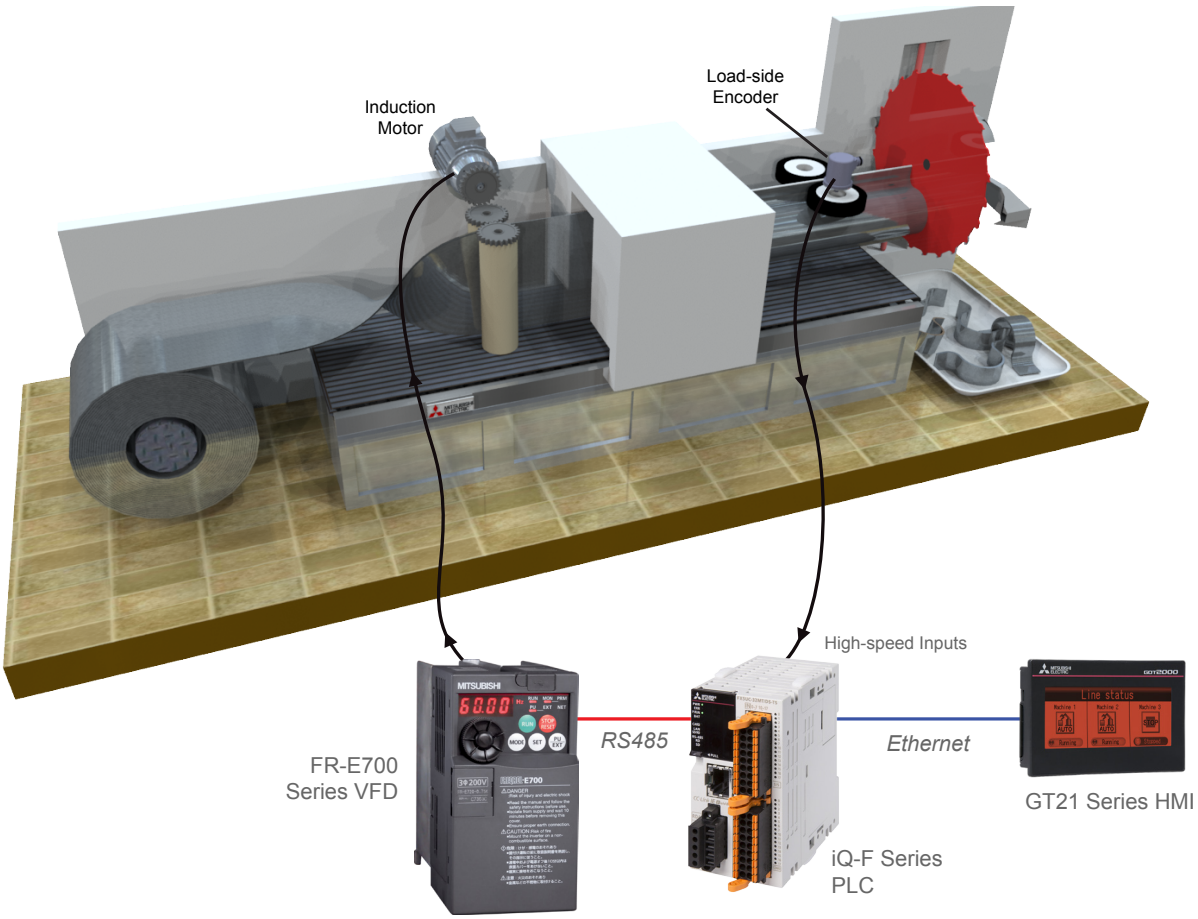
for a greener tomorrow

MITSUBISHI ELECTRIC
Changes for the Better

MITSUBISHI SOLUTIONS
Cut-to-Length – Low Cost Application Guide



TYPICAL USE CASES

Cut-to-length machines exist in a variety of industries to support applications including:

- Bar feeders
- Wood cutting
- Sheet metal cutting
- Wire cutting
- PVC cutting

OVERVIEW

Low cost cut-to-length applications cut raw material and are typically specified with variable frequency drives (VFDs) to drive an induction motor. The induction motor intermittently indexes the material at fixed length distances before each cut. The challenging part involves monitoring feedback from an external load-side encoder using semi-robust fully-closed loop control to stop the motor accurately so that each part can be cut with the same length. An alternative, much less accurate solution uses a photoelectric sensor to detect the material's edge so that the motor can decelerate for a coast to stop.

Cut-to-Length

SOLUTION SET

PLC: iQ-F Series (FX5UC)

VFD: FR-E700 Series (FR-E710W)

HMI: GT21 Series HMI (GT2107)

Serial Communication Board or Adapter: Built in RS-485 port on FX5UC

KEY PRODUCT ATTRIBUTES

- Low-cost VFD and PLC solution offers small sized components for machines with a small budget
- Accurate stopping with encoder feedback to PLC includes high-speed counter inputs and the option to use 4-edge counting
- Advanced magnetic flux vector mode
- Built-in PLC instructions to control the VFD
- Compliant with global standards: RoHS, UL, cUL, and CE (LVD)
- VFD self-diagnostics include the monitoring of internal components to prevent unnecessary downtime, as well as system protection and overload functions
- Open networking
- 5 year drive warranty

THE BOTTOM LINE

- Excellent stopping accuracy within ±1/16th of an inch
  - Less waste material
- Improved machine throughput
  - Higher profitability
  - Improved overall equipment effectiveness (OEE)
- Advanced magnetic flux vector mode grants high starting torque to begin moving material quickly
  - Smooth motor operation at a low speed to ensure accurate stopping
- Simplified machine operation for operator due to built-in PLC instructions
  - Less hassle during machine setup
- Reduced total cost of ownership
  - Longer lifespan due to less wear and tear on internal components
- Warranty offers reduced engineering and maintenance costs
  - No need to change or replace equipment

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