Hydraulic Flying Cutoff Controller

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Flying
Cutoff
Controller

Overview

UNICO's Hydraulic Flying Cutoff controller is application-specific software that controls a hydraulic flying cutoff die accelerator system that utilizes a servo valve, a hydraulic cylinder, and a serial linear absolute encoder for control. When used in conjunction with a programmable logic controller, the controller forms a powerful automation work cell that can either stand alone or be easily integrated with other UNICO automation cells to build a complete control system.

Features

Cut-to-Length or Cut-to-Mark

The flying cutoff control cuts a continuously moving strip of material into lengths by accelerating a die to synchronize with the material, make its cut, and return home to await the next cycle. A measuring wheel is used to track the movement of the material. Two different modes offer the choice of cutting prescribed lengths or cutting relative to printed registration marks or holes using a mark detector to scan the material. Windowing features protect against spurious mark errors.

Optimum Home Position

To maximize production, the software calculates an ideal home position to which the die returns between cuts. This is the furthest point the die must go to accommodate a given length at maximum line speed. This approach dramatically improves the accuracy of cuts made while the line is accelerating and increases production when cutting short lengths. Alternately, a traditional fixed or dynamically calculated home position may be used.

Batch Control

Two different part lengths and batch sizes can be specified at once, allowing the operator to set up the next order while the current one is running. A single length may also be produced indefinitely. Orders change automatically at the end of a batch or when requested by the operator. A customizable early warning feature indicates when a batch is nearly complete. If a defective piece is removed, a reject part input lets the operator correct the part count.

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Crop Modes

Selectable cropping methods provide a choice between cutting a fixed-length piece, cutting the shortest possible length for the given line speed, and cutting a length specified by how long the operator holds down the crop button.

Simulators

Several simulation tools facilitate setting up, testing, and troubleshooting a flying cutoff system. A line simulator makes it possible to run the cutoff without material by simulating the feedback that the measuring wheel would provide as the line ramps up, ramps down, or runs at speed. A mark detector simulator produces marks at a specified separation to allow testing in cut-to-mark mode. A shear simulator is useful for testing carriage travel without firing the ram.

Cut Engage Tuning

Alternate tuning can be used during the duration of a cut to accommodate flying saws and other machines having lengthy cut engage times

Operator Interface

A 10.4" color touchscreen utilizing the on-board offered Modbus RTU Slave protocol gives the operator the ability to set up to 10 cut lengths and batch sizes for smooth production runs. Fault messaging and operational prompts are also available. Maintenance level screens are available behind a password protection.

Warning and Protection

The program detects and protects against a number of fault conditions specific to a flying cutoff application, including out-of-tolerance parts, forward rack over travel, and line-too-fast situations where the line is unable to produce the desired length at its current speed. The software can also detect missing or erroneous marks and recover by making the cut at the expected location.

Serial Communication Options

A variety of serial communication protocols are supported for interfacing with a programmable controller or operator interface. The Modbus RTU and ANSI protocols are standard and do not require an add-on communication module. The drive can also communicate the following protocols by using the appropriate add-on communication modules.

- ETHERNET/IP / MODBUS-TCP INTERFACE
- PROFIBUS DPV1 INTERFACE
- CANOPEN SLAVE INTERFACE
- DEVICENET SLAVE/ADAPTER HMS# AB4004
- INTERBUS SLAVE/ADAPTER
- CONTROLNET SLAVE/ADAPTER
- LONWORKS SLAVE/ADAPTER
- MODBUS PLUS SLAVE/ADAPTER
- PROFIBUS DPV1 INTERFACE
- CC-LINK INTERFACE
- ETHERCAT INTERFACE
- PROFINET-IO INTERFACE
- MODBUS-PLUS SLAVE/ETHERNET
- ETHERNET/IP / MODBUS-TCP INTERFACE - 2-PORT
- PROFINET-IRT INTERFACE CARD - 2-PORT
- PROFIBUS PROFIDRIVE V2 INTERFACE

Inputs/Outputs

A variety of input/output functions are provided for integrating the flying cutoff control with external devices. The user can select the functions required by a given system and specify their corresponding hardware or serial I/O points.

Inputs
- motor on
- fault reset
- jog forward
- jog reverse
- reference request
- auto
- crop request
- cut engaged
- reference switch
- advance mark
- batch reset
- part reject
- clear mark queue
- fast stop
- motion enable
- alternate length
- sample cut
- follow source 2

Outputs
- motor on
- no fault
- manual
- auto
- crop
- forward limit
- reverse limit
- fire shear
- reference grant
- line too fast
- forward limit fault
- part error
- detector error
- batch complete
- early warning
- in motion
- forward motion
- reverse motion

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UNICO — Worldwide

Corporate Headquarters

Unico is a leading global innovator of motion-control solutions for industry. Founded in 1967, the company develops, manufactures, and services variable-speed drives, application-engineered drive products, integrated drive systems, and ancillary products that improve operations by increasing productivity, safety, and equipment life while lowering energy and maintenance costs.

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