



APPLICATION SOLUTION MDC #01

WOOD CUTTING MOTOR DRIVE CONTROL FOLLOWER APPLICATION

A board manufacturer wants to control the feed rate of lumber into a saw at the speed the saw is running. He also wants a warning light when the conveyor has stopped moving and a deviation alarm when the conveyor speed does not match the saw speed.

PRODUCTS USED: MDC00100, LMPC0000, ZFG0120C, LSACH001, WF1000OR

The MDC Motor Drive Controller with the LMPC0000 pick-up for the saw speed lead input and ZFG0120C pulse encoder for the conveyor speed feedback input was selected.

HOW IT WORKS

The saw blade runs at a maximum speed of 2200 rpm. (The operator determined that at this speed the conveyor would feed the lumber at a rate of 10.0 feet per minute.) The saw blade is driven by a shaft, which has a 60-tooth gear that a pickup senses for the lead input. The feedback signal is provided by a 120 ppr encoder that uses a 1 foot circumference wheel riding directly on the conveyor. In the follower mode, the MDC adjusts its 0-10 volt output to increase or decrease the conveyor speed to follow the saw speed.

For this application, the speed and ramp rate ratio between the lead and feedback is set to 1.0000. If the ratio were increased, the conveyor would run faster than the saw. If decreased then the conveyor would run slower.

The MDC has two alarm outputs. One is programmed as Zero Speed to inform the operator if the conveyor had stopped moving. The other alarm is programmed as a deviation alarm to warn if the blade got loaded down too much. To eliminate the need for external switches, the front F1 and F2 buttons are programmed for Run and Stop respectively.

DESIGN ADVANTAGES

With the MDC, the conveyor properly fed the wood to the saw increasing productively and decreasing scrap and saw blade problems.

ADDITIONAL CAPABILITIES

The MDC is factory programmed with four two line main displays. These displays can be reprogrammed to suit the operators' needs. The Ramp Stop and Fast Stop inputs can be wired to external normally closed emergency switches. A second speed and ramp rate ratio value can be preprogrammed which can be activated with a switch through a user input. The MDC has a test drive out feature, which can manually adjust the 0-10 VDC output without a feedback or lead input.

DIP SWITCH OR JUMPER SETTINGS

After programming, place 5 up for program lock.

PROGRAMMING (Only non-factory settings shown)

USER SETPOINTS

AL-1 ZERO SPEED
AL-2 1.0 (deviation of calculated speed)

AL-2 YES
GAIN NO
SPT SCROLL NO

SCALING

PPR LD 60 (lead gear)
MAX RPM LD 2200 (lead rpm)
PPR FB 120 (feed back encoder)
MAX RPM FB 10 (1 foot wheel at 10 ft/min)
DSP DP 0.0
DSP UNIT 10.0 (ft/min at 2200 lead rpm)

ALARM OUTPUTS

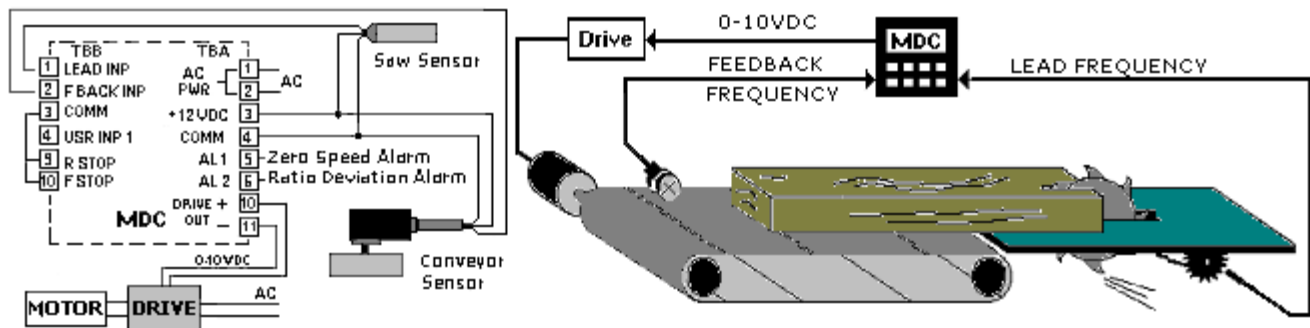
ALARM 1: ZERO SPEED
ALARM 2: DEVIATION

OPERATOR ACCESS

S1 NO
S2 NO
R1 NO
R2 NO
JOG SPD NO
AL-1 NO

WIRING DIAGRAM

All wiring must be according to the installation guidelines listed in the product's specifications. For the setpoint outputs to function an external isolated voltage source (not shown below) must be connected in series.



This application note is intended to be an example. Your specific application may require changes in products, programming and/or wiring. For specific assistance, you may contact your local Red Lion products supplier or Red Lion Controls Technical Support at 717-767-6511.