Absolute Process Instruments, Inc.
Manufacturer of Quality Signal Conditioners Transmitters & Isolators
Application Notes

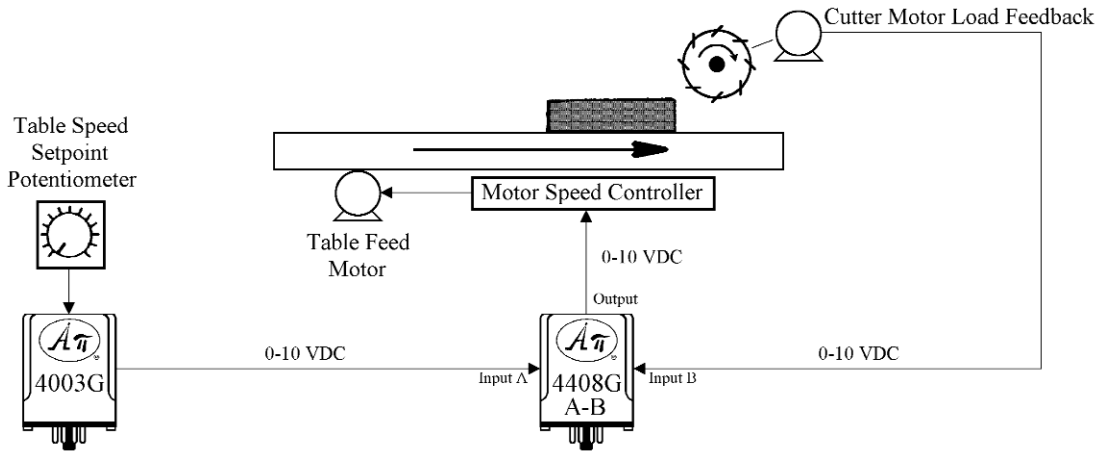
Automation of a Milling Machine Operation

PROBLEM

The optimum speed at which material is fed into a mill cutter is dependent on several factors. Included among these factors is the amount of material to be removed, the density and hardness of the material and the sharpness of the cutter. Ideally, these remain constant and the feed rate can be set and maintained throughout the operation. In the real world, however, material size, shape, density and hardness can vary greatly, and cutters become dull with use. These changes affect the load on the motor driving the mill cutter and a feedback signal of this load can be used to adjust the feed rate to compensate.

SOLUTION

On a milling machine equipped with load feedback on the cutter, an effective automatic table feed control system can be implemented using an **API 4003 G** Potentiometer to DC Transmitter module for a speed reference signal and an **API 4408 G** A-B Math Function with Isolated DC Output module to reduce the speed command to the table motor controller as cutter load increases.



Here, the milling machine is equipped with a controller which accepts a 0-10 VDC input to vary the speed of the moving table. It is also equipped with a 0-10 VDC output signal which is directly proportional to the load on the cutter. The **API 4003 G** sets the maximum speed of the table with no load on the cutter. The **API 4408 G** subtracts the load feedback signal from the maximum table speed signal and sends the resulting signal to the table motor speed controller. Thus the speed of the table is reduced as the load on the cutter increases, compensating for variations in material shape, density and hardness, as well as cutter sharpness.

Did You Know...?

Poor quality sockets put your process at risk. For your convenience, Api stocks quality 8-pin and 11-pin sockets for use with our modules.