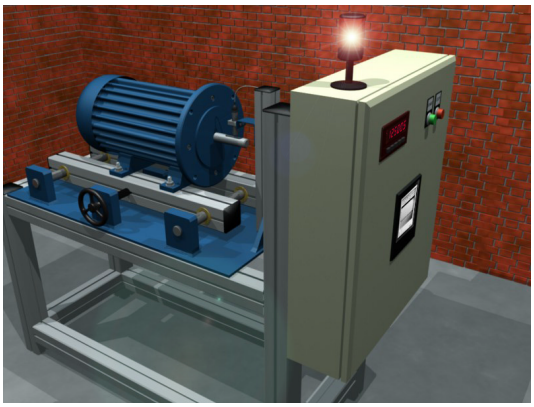
APPLICATION SOLUTION PAXI #01

MONITORING MOTOR SPEED WITH ANALOG OUTPUT APPLICATION

A recent application required monitoring the speed of a motor. The customer, a motor testing facility, needed a device to display the motor's speed in RPM, as well as provide a 4-20 output to chart the speed over a long period. An alarm was required to keep the operator from inadvertently running the motor too fast.

PRODUCTS USED: PAXI000, PAXCDS10, PAXCDL10, LMPC000, 5400100



The PAXI0000 was selected to display the rate, the PAXCDL10 optional analog output card used to drive a chart recorder, and the dual alarm relay card for the over speed condition. To sense the motor's speed, an LMPC0000, with the block mount 5400100, was selected to look at a keyway on the turning motor shaft.

HOW IT WORKS

The customer wants to display revs per minute (RPM) and they have one pulse (keyway) per rev. When using a rate display value of 60, the rate input in Hz is always the number of pulses per unit, in this case 1.0. (60 RPM X 1 pulse/60 sec= 1.0 Hz). Entering rate display of 60 and rate input of 1.0, in program module 4-rtE, the display will show the correct RPM at all speeds.

The first setpoint SP1 is programmed, in module 6-SPt, to turn on a warning light for over speed. When SP1 is setup in the bounty high action, it will turn off when the speed returns below the entered value. If the motor speed continues 10 RPM above the over speed setpoint value, SP2 relay can be programmed to latch open. While in the latched open condition, the front reset button can be configured, in module 2-FNC, to force the operator to press the button to restart the test. The analog output is programmed, in module 8-ANA, to send 4 mA at 0 RPM and 20 mA at the maximum RPM to the chart recorder.

After configuration is complete, the programming mode can be locked by setting User-1, in module 2-FNC, as PLOC and jumping User-1 to User Common. It is possible to allow the operator to change just SP1 value by making SP1 enter in 3-LOC and making setpoint SP2 track SP1 in 6-SPt.

DESIGN ADVANTAGES

With the PAXI0000 LED display, the operator could easily see the running RPM value. The analog output card supplied a signal to the chart recorder for a record of the motor speed performance. The dual alarm relay card gave a warning of an over speed condition and turned the motor automatically off in a run away condition. Just one meter gave both the needed data and a safety system.

Additional Capabilities

Serial communications option card can be added to interface the PAXI to a computer or a data logging system.

Dip Switch or Jumper Settings

All are at factory settings.

Programming (Only nonfactory settings shown)

2 - FNC
USr-1 : PLOC
RSt : SPrtL
SP-2: YES

3-LOC
A-CNt : LOC
ASCFAC : LOC
SP-1 : Ent

4 - rtE
rtE dP : 0
rtEdSP : 60
rtE INP : 1.0

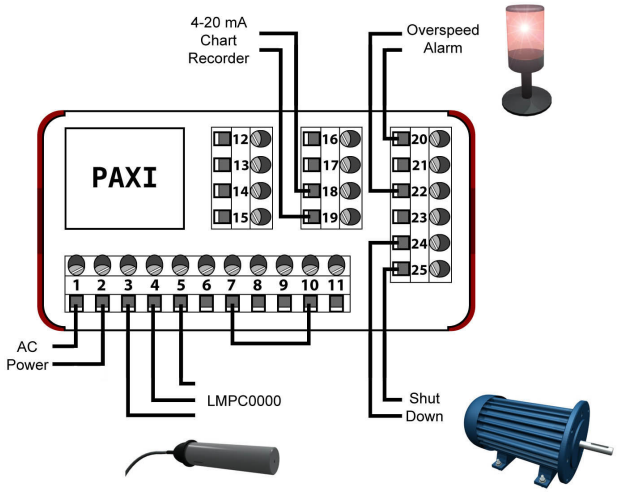
6-SPt
SPSEL : SP-1
Act-1 : bOUNd
ASN-1 : rAtE
SP-1 : xx (over speed alarm value)
tYP-1 : HI
HYS-1 : 1

SPSEL : SP-2
SUP-2 : SAVE
Act-2 : LAtCH
ASN-2 : rAtE
TrC-2 : SP-1
SP-2 : xx (shut down value 10 + SP-1 value)
tYP-2 : HI

8-ANA
AN-HI : xx (max speed)

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.