APPLICATION SOLUTION PAXC #02

POSITION IN DEGREES OF ROTATION APPLICATION

An animal feed producer wants a display to show the position of his hand moveable lever that controls the flow into his process. The lever turns around the hopper. He wants to see degrees of rotation in tenths from 0.0 to 360.0. The higher the degrees the larger the opening will be. At the 0.0/360.0 transitions, the opening will be closed or full open based on the direction of turn.

PRODUCTS USED: PAXC0000, PAXCDS10, ZDH1000H

The RPGD rotary pulse generator part# ZDH1000H was chosen because 1000 pulse per revolution and it is quadrature allowing counting up and down. The customer will use a belt to couple the lever movement to the encoder with a ratio of one to four. The PAXC0000 Counter with PAXCDS10 Setpoint Relay Card is the meter for this application.

HOW IT WORKS

With the coupling ratio between the lever and the 1000 ppr encoder, the pulses per one lever revolution would be 4000. There are 360 degrees in a revolution so the number of pulses per one degree is 11.11 (4000/360). Because the desired reading is in tenths of degree, the scale factor is (10/11.11) or 0.9. The scale factor, quadx1 count mode, and display decimal are entered in program module 1-INP. (With a ratio of one to one, quadx4 count mode with the same scale factor and display decimal would be entered.)

The setpoint card outputs are not used but the card is needed for the setpoint values for the transition between 0.0 and 360.0. Setpoint 1 is programmed for 360.0 with an auto reset of the display to 0.0. Setpoint 2 is programmed for negative 0.1 with an auto reset of the display to count load value of 359.9. The setpoint action for both is timed out because this is the action that allows the counter auto reset feature. The timed value is set to the lowest value of 0.01. This is setup in program module 6-SPt.

The reset button can be disabled in module 3-FNC once the lever is at the 0.0 position and the RST button was pressed. After this, programming user-1 PLOC and connecting user 1 to common will lock the program.

DESIGN ADVANTAGES

The feed producer can now accurately determine the opening to his hopper by the position of the lever greatly improving his efficiency.

ADDITIONAL CAPABILITIES

An optional four setpoint alarm card could be added to give visual or audio indications of various positions.

DIP SWITCH OR JUMPER SETTINGS

All are at factory settings.

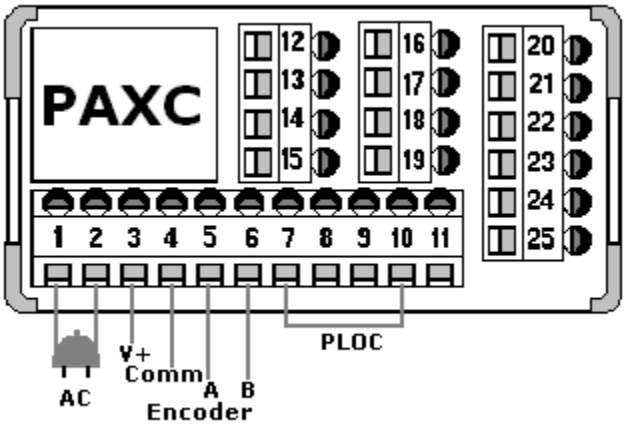
PROGRAMMING (Only non-factory settings shown)

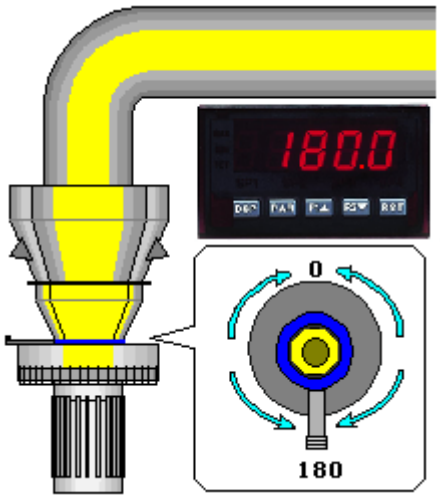
1-INP
A CNT: QuAd1
AdECPT: 0.0
ASCFAC: 0.9
ACNtLd: 359.9
2-FNC
USr-1: PLOC
RSt: NO (Make no after the lever is at 0.0 and RST front button was pressed.)
3-LOC
ASCFAC : LOC (Add terminal 7-10 jumper after making RST NO.)

6-SPt
SPSEL : SP-1
ACt-1: tOUt
SP-1: 360.0
TOUT-1: 0.01
AUTO-1: ZerOAS (auto reset to 0.0)
SPSEL : SP-2
ACt-2: tOUt
SP-2: -0.1
tOUt-2: 0.01
AUTO-2: CldAS (auto reset to 359.9)

WIRING DIAGRAM

All wiring must be according to the installation guidelines listed in the product's specifications.





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.