Tutorial 3a

Quadrature Decoding

An optical linear position encoder has three outputs: channel A, channel B, and zero index.

(a) Draw the typical waveforms of channel A and channel B for the forward and reverse motion of the linear position encoder

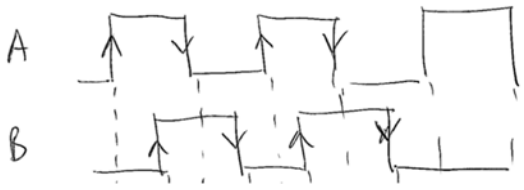
(b) What is quadrature decoding? Describe how the up count and down count pulse can be decoded from the waveforms in (a), by using quadrature decoding.

(c) Explain how you can use the outputs this linear position encoder to obtain the absolute position and velocity.

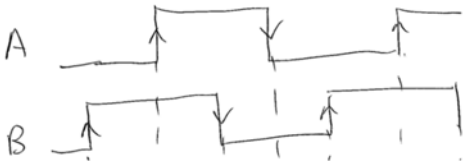
Solution

(a)

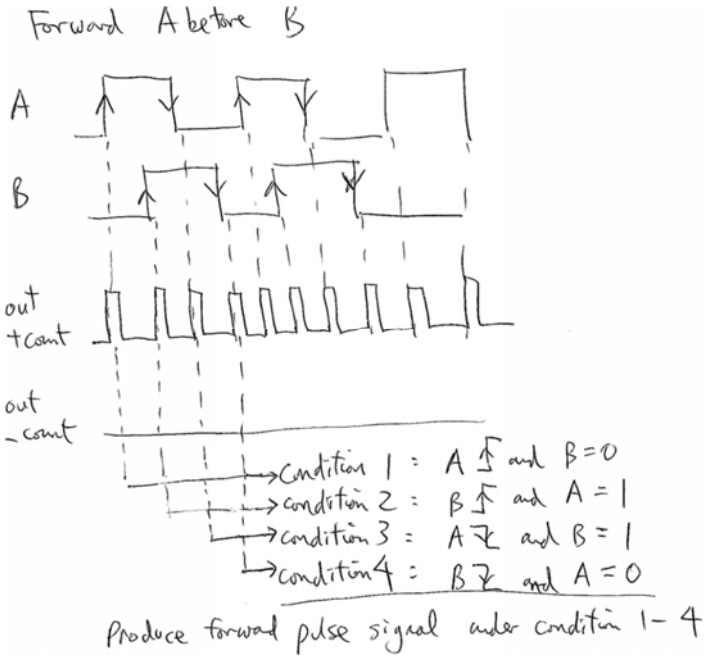
Forward:

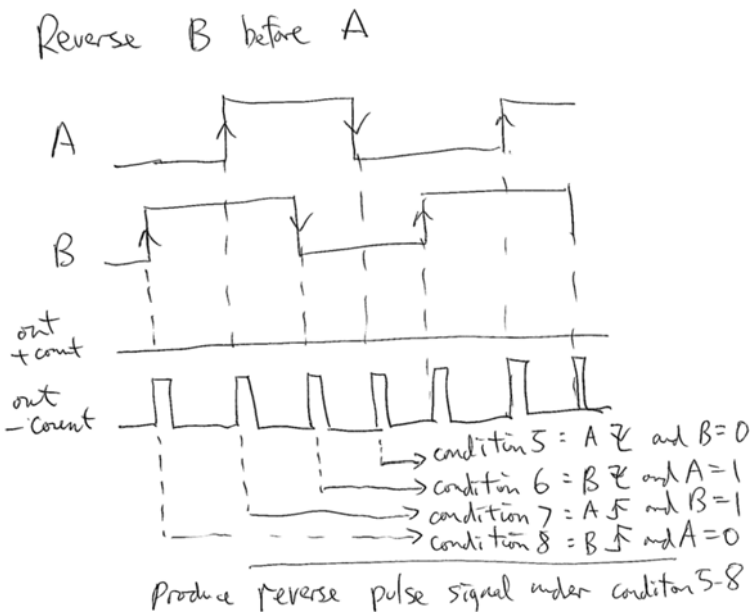


Backward:



(b) Quadrature Decoding: To convert the A-B phase waveforms from to quadrature encoder into up and down count pulses at FOUR times its original resolution.





(c) The hardware configuration