



AMT102, AMT103 Specification (ASIC Rev B)

Resolution, Accuracy, & Max Speed.

As the quadrature output of these encoders is based on interpolations of an analog function, the accuracy characteristics are more comparable to a resolver than to an optical encoder.

The accuracy of resolvers is usually expressed in arc minutes and therefore we use that unit here also.

The ASIC in these encoders has four different operating modes giving the four basic resolutions of 256, 512, 1024, and 2048 PPR for this encoders. The error characteristics are different for these four basic modes. The sub-resolutions to the left of the basic resolutions are derived from the basic resolutions by a rate multiplier, and retain the accuracy characteristic of the corresponding basic resolution.

D2, D1	D0, K3				Accuracy Arc Minute	Linearity Error % of one turn	Max Speed RPM	Time Constant ms
	1,1	1,0	0,1	0,0				
1,1	2048	1000	800	384	±15	±0.1%	7,500	0.4
1,0	1024	500	400	192	±15	±0.1%	15,000	0.4
0,1	512	250	200	96	±30	±0.15%	30,000	0.2
0,0	256	125	100	48	±60	±0.3%	30,000	0.2
	(Resolution PPR)							

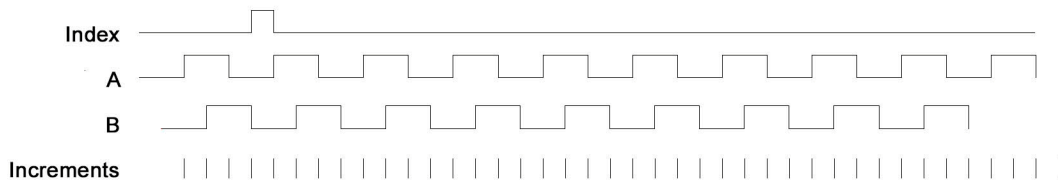
The quadrature resolution is 4 times the PPR resolution given in above table.

The max speed in the table is, for the three first lines of resolution values, a function of the max quadrature pulse rate that the ASIC can deliver, ~250 kHz. The limitation at the lowest resolution is a mechanical limitation.

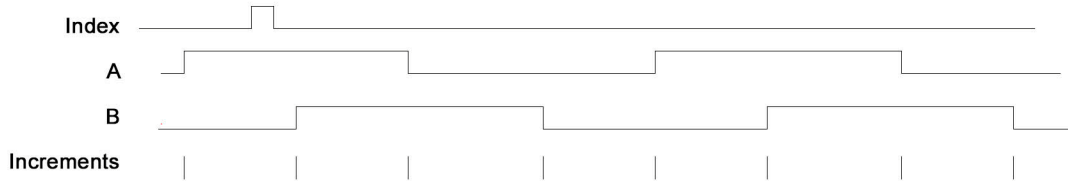
The Index Pulse.

The index pulse width is equal to one increment of each basic resolution, and it stays at that length for the other resolutions on the same line. This means that in, for example, the resolution according to the first line table, the index length is 1/8192 of a turn for all those resolutions. Examples:

Resolution 2048 PPR:



Resolution 384 PPR:



In the non-binary resolutions the index position with A and B pulses is arbitrary, but it is always within the same increment of rotation position. If the index pulse is used for synchronizing a position counter, it should not matter where within a count the index pulse is located.