

# EMA SERIES

## STAND ALONE ENCODER

### FEATURES

- Quadrature output (Channel A, Channel B, Index)
- Several resolutions available
- Low inertia:  $5.19 \times 10^{-8} \text{ kg}\cdot\text{m}^2$
- Interfaces directly with Magtrol controllers
- Mountable to a Magtrol PT 25 Base Plate

### DESCRIPTION

Magtrol's EMA Series Stand Alone Encoder provides a square wave output on two channels for up/down counting or free-run motor speed measurement applications. Each channel outputs the specified pulses per revolution of the encoder shaft, and is  $90^\circ$  phase-shifted in order to determine direction when used with the appropriate counter/timer DAQ board.

The device incorporates an infrared optical switch and disk assembled into a rugged aluminum housing. The encoder is supplied with an 8 mm rectangular key for easy alignment to a Magtrol PT 25 Base Plate.

### OPERATING PRINCIPLES

A quadrature encoded signal consists of two square-waves, A and B, which are offset from each other by  $90^\circ$ . The direction of rotation can then be inferred from the order in which the two sensors detect each radial line. If A leads B by  $90^\circ$  (as shown in the figure to the right), the shaft is rotating clockwise. If A lags B by  $90^\circ$ , the shaft is rotating counterclockwise. The rate of either square-wave depends on the rotational speed of the shaft.

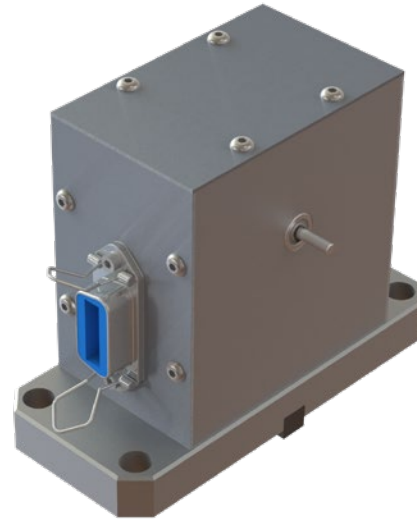
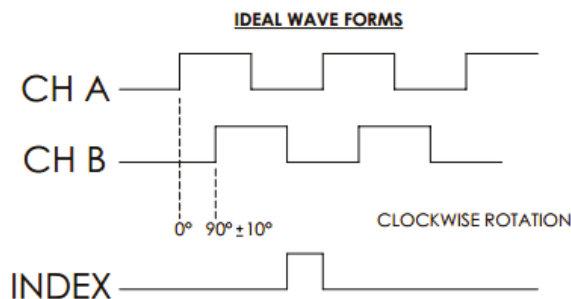


Fig. 1: EMA Series Stand Alone Encoder

### DIMENSIONS

	IN	MM
width	4.528	115
depth	1.969	50
height	3.543	90

Note: Width and depth are base dimensions.

Detailed dimension drawings can be found on Magtrol's web site. Solid 3D models are also available by contacting Magtrol.

## SPECIFICATIONS

### RATINGS

Maximum Mechanical Speed	35 000 rpm
Maximum Drag Torque @ 1,000 rpm	.353 mN·m
Inertia	5.19 x 10 <sup>-8</sup> kg·m <sup>2</sup>

### ELECTRICAL CONNECTIONS <sup>a)</sup>

OUTPUT FUNCTION	PIN# 14 PIN CONNECTOR
Channel B	2
+5 Volts	7
Common	8
Channel A	10
Index	11

a) 14-pin cable (P/N 88M007) must be ordered separately.

## ORDERING INFORMATION

MODEL	STOCK CODE	DESCRIPTION	READABLE SPEED <sup>b)</sup> [rpm]
EMA-0050	007204	ENCODER MODULE ASSY, 50 PPR	35 000 <sup>c)</sup>
EMA-0096	007205	ENCODER MODULE ASSY, 96 PPR	
EMA-0100	007206	ENCODER MODULE ASSY, 100 PPR	
EMA-0192	007207	ENCODER MODULE ASSY, 192 PPR	
EMA-0200	007208	ENCODER MODULE ASSY, 200 PPR	
EMA-0250	007209	ENCODER MODULE ASSY, 250 PPR	
EMA-0256	007210	ENCODER MODULE ASSY, 256 PPR	
EMA-0360	007211	ENCODER MODULE ASSY, 360 PPR	
EMA-0400	007212	ENCODER MODULE ASSY, 400 PPR	
EMA-0500	007213	ENCODER MODULE ASSY, 500 PPR	
EMA-0512	007214	ENCODER MODULE ASSY, 512 PPR	
EMA-0720	007215	ENCODER MODULE ASSY, 720 PPR	25 000
EMA-0900	007216	ENCODER MODULE ASSY, 900 PPR	20 000
EMA-1000	007217	ENCODER MODULE ASSY, 1 000 PPR	18 000
EMA-1024	007218	ENCODER MODULE ASSY, 1 024 PPR	18 000
EMA-1250	007219	ENCODER MODULE ASSY, 1 250 PPR	14 000

b) Confirm instrumentation can read developed frequencies.

c) Limited by maximum mechanical speed.