

Description

The **SP-16** is a rugged, reliable, low cost optical incremental encoder that converts shaft angle, speed, and direction into real-time digital information. The shaft is torque-loaded to feel like a potentiometer. Two quadrature outputs provide 64 quadrature states per revolution (16 CPR x 4). TTL compatibility is achieved by feeding the outputs through an external 74LS244. The internal electronics and LEDs draw less than 27 mA from a single +5 V supply. Placed behind a knob on a front panel, the SP-16 offers these advantages over other types of man-to-machine interfaces: direct rotary to digital conversion with no digit bobble, no contact wear and no mechanical stops. Limits can be defined by the system designer. No gearing is required for multi-turn operation. Non-torque loaded and ball bearing versions of the **SP-16** are available for motion control applications.



Mechanical

Shaft Speed:

(D-option, N-option) 100 RPM continuous

(B-option) 10,000 RPM continuous

Shaft Torque:

(D-option) 0.7 ± 0.3 in. oz.

(N-option) 0.3 in. oz. max.

(B-option) 0.05 in oz. max.

Shaft Loading:

1 lbs. max. (running)

10 lbs. max. (stopped)

Weight: 1.0 oz.

Mounting

Hole Diameter: .380 in.

Panel Thickness: .125 in. max.

Panel Nut Max. Tightening Torque: 20 in.-lbs.

Environmental

Operating Temperature: -20 C to 85 C

Storage Temperature: -40 C to 85 C

Humidity: 0 % to 100% non-condensing

Shock: 40 G for 11 mS

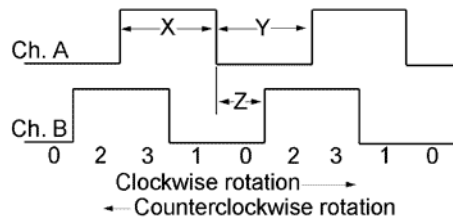
Vibration: 0 Hz to 60 Hz, 20 G

Electrical

Parameter	Min.	Typ.	Max.	Units	Notes
Supply Voltage	4.5	5.0	5.5	V	
Supply Current	-	22	27	mA	
High Level Output Voltage	3.5	5.0	5.5	V	
Low Level Output Voltage	-	.15	0.4	V	
Output Current (IoutL)	0.5	2.0	-	mA	Vout=0.5 V
Output Current (IoutL)	-	8	18	mA	Short to Vcc
Symmetry	150	180	210	deg.	See note 1
Quadrature	60	90	120	deg.	See note 2

1. Symmetry is a measure of the relationship between (X) and (Y) in electrical degrees.
2. Quadrature is specified by (Z) and is the phase lag or lead between channels A and B in electrical degrees.

TTL-Output Waveform



Ordering Information

SP-16 -

Torque

D =Default (D)

B =Ball Bearing (B)

N =No-torque (N)

Notes

- Cables and connectors are not included and must be ordered separately.
- For ordering information please see the Compatible Cables / Connectors section above.
- US Digital warrants its products against defects in materials and workmanship for two years. See complete warranty for details.

Pricing

Quantity	Price
1	\$54.25
10	\$46.28
50	\$41.60
100	\$36.50

- Add \$5.80 per unit for **Torque** of Ball Bearing (B)
- Add \$3.00 per unit for **Torque** of No-torque (N)