

Automotive Sensor Products

Linear Position Sensor – Hall



Figure 1: Linear Position Sensor

Features

- ◆ Magnetically operated position sensor
- ◆ Linear PWM outputs
- ◆ Programmable sensor – custom option
- ◆ Separate magnet assembly as actuator
- ◆ Large air gap operating
- ◆ Non-contact measuring

Benefits

- ◆ Robust construction makes this sensor well suited to harsh environments
- ◆ Magnetically operated non-contact sensing gives excellent life and reliability
- ◆ Ability to customize programming output states to customer needs

Applications

- ◆ Transmission fork position
- ◆ Linear stroke

General Description

The Hall Effect Linear Position Sensor detects the position of each fork in a DCT transmission. Each position sensor operates in a pair with one magnet actuator. There are four pairs in total to detect the fork position of gears 1~7 and reverse position.

Operation

Basic Principle

The sensor is a linear PWM output sensor which detects the position of moving parts. After programming, the sensor will output a linear PWM signal to reflect the position of the magnet assembly actuator.



Figure 2: Magnet Actuator



Figure 3: Linear Position Sensor

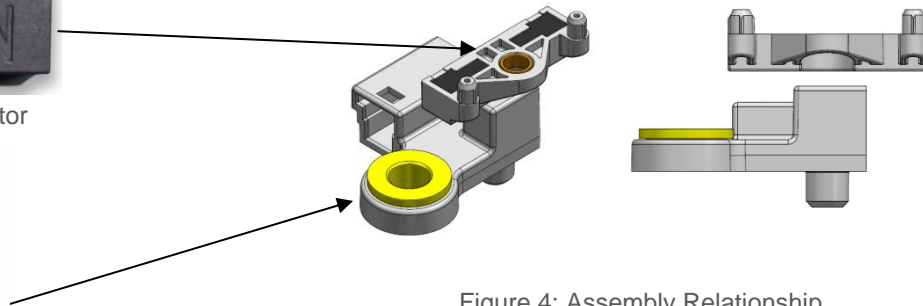


Figure 4: Assembly Relationship

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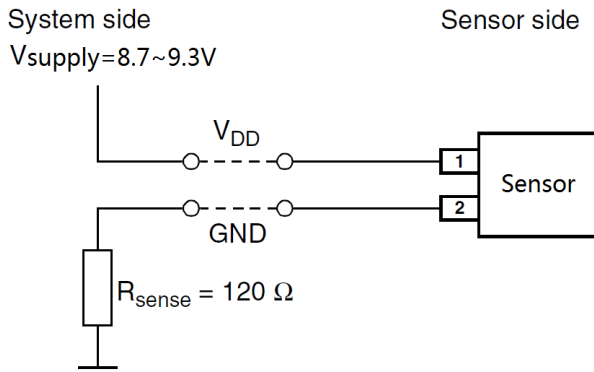


Figure 5: Typical Application Schematic Diagram

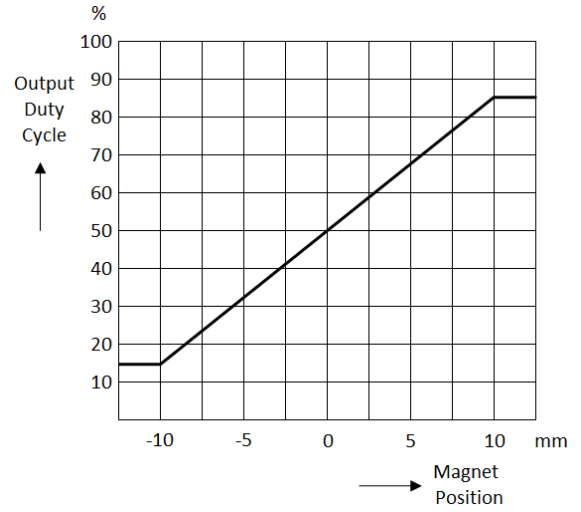


Figure 6: Output Curve

Packaging Options

Custom packaging can be provided to meet any need, please contact Littelfuse Engineering for details.

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Functional Characteristics

Parameter			
Type			
Hall Effect Sensor		Programmable	
Output		Linear PWM Duty Cycle	
Electrical			
Voltage Supply	Max.	9.3Vdc	
	Min.	8.7Vdc	
PWM Output Signal Current	Low	4.0 ~ 8.0mA	
	High	12.0~ 16.5mA	
PWM output Frequency		420~540Hz	
Magnet to Sensor Air Gap	Max.	2.3mm	
	Min.	4.7mm	
Magnet Linear Sensing Range		-10~+10mm	
Repeatability Across Temp Range		0.5%FS	
Sensor Output Performance (typical)	Air Gap	-10.0mm	+10.0mm
	2.3mm	15%DC	85%DC
	3.5mm	25%DC	75%DC
	4.7mm	33%DC	67%DC
PWM Output Signal Clamps	Min.	3%DC	
	Max.	97%DC	
Environmental/Mechanical			
Temperature	Operating	Celsius	-40° C to +140°C
	Storage	Celsius	-55°C to +150°C
Mechanical Shock	15ms ½ Sine	Max.	25g
Random Vibration	12 – 2000Hz	Max.	RMS MAX 4.2g

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