

INDUSTRIAL, TRANSPORTATION, AND AEROSPACE APPLICATIONS

SMART Position Sensor, 35 mm, 75 mm and 225 mm Linear Configurations

Superior **M**easurement. **A**ccurate. **R**eliable. **T**hinking

Solutions

The SMART Position Sensor is one of the most durable, adaptable, and lightweight linear position sensors available in the industry, enabling highly accurate motion control and improving operation efficiency and safety. They are Honeywell's first non-contacting linear position sensors that allow unparalleled accuracy and reliability in applications that require measurement of any linear movement. Their simple, non-contact design:

- Eliminates mechanical failure mechanisms
- Reduces wear and tear
- Improves reliability and durability
- Enhances operation efficiency and safety
- Minimizes downtime

It senses the position of a magnet relative to the sensor in one of three available sensing ranges:

- 0 mm to 35 mm [0 in to 1.38 in]
- 0 mm to 75 mm [0 in to 2.95 in]
- 0 mm to 225 mm [0 in to 8.86 in]

It is available in both analog output (35 mm, 75 mm and 225 mm configurations) and an RS232-type digital output (225 mm configuration only) for use in control systems requiring an RS232 interface with a 57.6 bits/s baud rate.

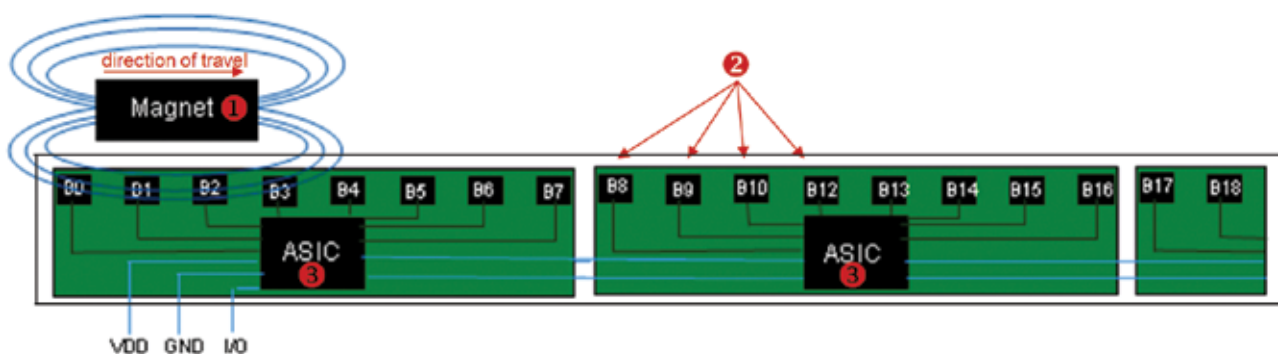
Why is the SMART Position Sensor Smart?

SMART means that this is a sensor that can essentially think for itself. SMART Position Sensors provide a self-diagnostics feature and data gathering for enhanced reliability and closed-loop feedback control.

With this sensor, Honeywell has utilized MR technology through the ASIC at a level never before accomplished.

How the SMART Position Sensor Works

The linear configuration senses the position of a magnet relative to the sensor from 0 mm to 35 mm, 75 mm or 225 mm. Fig. 1 is a graphical representation of how the linear configuration operates.



The magnet actuator **1** is attached to the moving object (e.g., elevator, equipment, valve, etc.). The blue lines around the magnet actuator represent the magnetic flux exiting the magnet actuator and intersecting the MR bridges **2** that are mounted on the Linear SMART Position Sensor magnet actuator's direction of travel. The output from the MR bridges passes to the ASIC **3** that calibrates the magnet actuator's position.

Figure 1. SMART Position Sensor Linear Configuration Operation

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POTENTIAL APPLICATIONS

Figures 2 through 14 show a variety of linear position sensing applications where the SMART Position Sensor may be used. Applications pertain to all configurations except where noted.

Industrial

- **Valve position:** May be used to monitor valve position so that the desired amount of liquid is delivered based on the position of the valve that is opening/closing, and how long it is open/closed (e.g., bottling machines, food/chemical processing, water handling equipment, etc. (See Figure 2.)
- **Material handling:** May be used on a lifting device that moves cartons from one conveyor belt to another. (See Figure 3.)
- **Plastic molding:** May be used for injection positioning. (See Figure 4.)
- **Cutting and slitting:** May be used in paper mills to accurately control the location of the slitter before it cuts. (See Figure 5.)
- **Wafer handling:** May be used to monitor if parts are properly placed. (See Figure 6.)
- **CNC machines:** May be used to monitor the tool depth and direction of travel. (See Figure 7.)

Transportation

- **Engine transmissions (35 mm only):** May be used for gear shift position for trucks. (See Figure 8.)
- **Passenger bus level position:** May be used for passenger bus leveling to simplify access for passengers and luggage. (See Figure 9.)
- **Truck mounted crane outrigger position:** May be used to determine that the outriggers are fully deployed before the lifting of objects can begin. Also used to measure boom angle position. (See Figure 10.)



Figure 2. Valve position



Figure 3. Material handling

Photo source: Wikipedia



Figure 4. Plastic molding



Figure 5. Cutting and slitting

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- **Heavy mounted attachment identification:** May be used to sense which attachments are being deployed onto heavy equipment by the strategic placement of the magnet to sensor. The corresponding output indicates to the operator and control system which attachment is connected. (See Figure 11.)
- **Hydraulic cylinders (225 mm only):** May be used on non-ferrous hydraulic cylinders for non-contact stroke position. (See Figure 12.)
- **Marine motors:** May be used for trim position on inboard/ outboard motors for enhanced durability and performance. (See Figure 13.)

Aerospace

- **Aircraft actuators:** May be used to control actuator position on multiple applications in the aircraft, helping to regulate airflow to engines and environmental systems. (See Figure 14.)

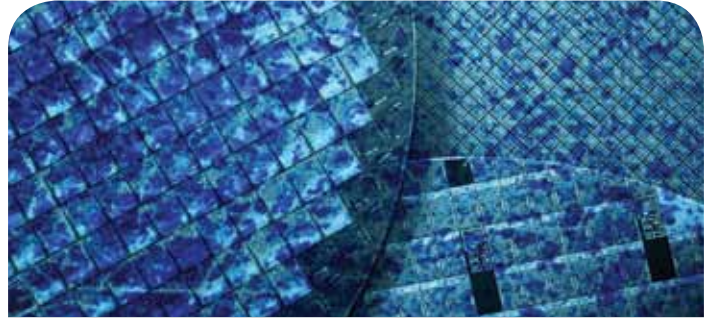


Figure 6. Wafer handling



Figure 7. CNC machines



Figure 8. Engine transmissions (35 mm only)



Figure 9. Passenger bus level position

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Figure 10. Truck mounted crane outrigger position



Figure 13. Marine motors

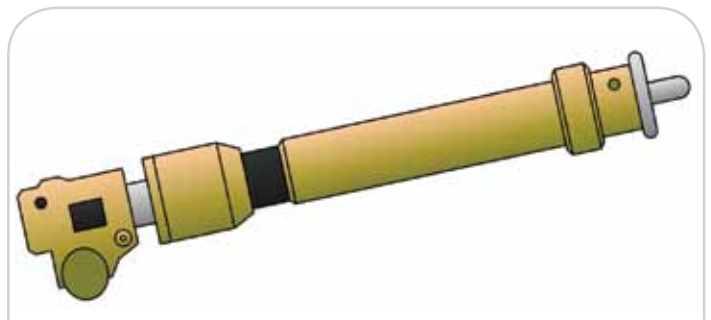


Figure 14. Aircraft actuators




Figure 11. Heavy mounted attachment identification



Figure 12. Hydraulic cylinders (225 mm only)

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SMART Position Sensors 35 mm, 75 mm, 225 mm Linear Configurations	Features and Benefits (★ = competitive differentiator)
	<ul style="list-style-type: none"> • Reliable, durable: Non-contact design reduces wear and tear, improving reliability and durability, and minimizing downtime ★ Easy to install: Installation takes four simple steps (1: position sensor; 2: drill holes; 3: mount sensor; 4: locate magnet actuator/make electrical connection) vs. up to 14 steps some competitive products require, simplifying installation and reducing set-up costs • Rugged: As there are no moving parts within the sensor, Honeywell utilizes unique packaging materials that make the sensor more resistant to vibration, shock, and extreme temperatures ★ Flexible: Air gap of up to $8,5 \pm 1,0$ mm [0.334 ± 0.039 in] between sensor and magnet expands application opportunities; variety of output options (analog standard and other RS232-type baud rates) are available, expanding application opportunities ★ Cost effective: Adaptable, non-contacting design allows customers to eliminate unnecessary connections for installation, thereby reducing installation steps, installation time, and components • Accurate: 35 mm version accurately measures values down to 0,04 mm [0.0016 in], 75 mm version accurately measures values down to 0,05 mm [0.002 in], while 225 mm version accurately measures value down to 0,14 mm [0.0055 in] (analog) and 0,0035 mm [0.000137 in] (digital) ★ Adaptable: Electronics on board allow for flexible packaging and component compatibility with existing systems ★ Lightweight: More than 50% lighter in weight than LVDT (Linear Variable Differential Transformer) technology • Simplifies design-in: Easy-to-configure sensor array fits virtually any linear movement path ★ Self-diagnostics feature: Can reduce equipment downtime by providing predictive maintenance input • Combined patented MR sensor and ASIC technology: Provides enhanced differentiation and performance • IP67 and IP69K sealing: Allow use in many harsh applications • Qualified for automotive grade EMI/EMC specification: Provides protection against environmental frequencies (35 mm version only) • RoHS-compliant materials: Meet Directive 2002/95/EC

Find out more

To learn more about Honeywell's sensing and control products, call **1-800-537-6945**, visit **sensing.honeywell.com** or e-mail inquiries to **info.sc@honeywell.com**

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