LaserSpeed®

Non-Contact Speed & Length Gauge

BETA LaserMike

Non-Contact Speed & Length Gauge

A breakthrough in electro-optics design enables Beta LaserMike's LaserSpeed® Series gauges to produce highly accurate, non-contact speed and length measurements at a surprisingly low cost. To accomplish this, LaserSpeed gauges use Beta LaserMike's signal processing engine, the most advanced, digital signal processing algorithm,coupled with new single-chip integrated circuit technology.

LaserSpeed gauges have no moving parts, use 100% solid-state digital technology, and are permanently calibrated—resulting in significant time and money savings. With accuracy up to ±0.02%, LaserSpeed gauges are ideal replacements for contact encoders which are prone to measurement errors caused by slippage, dirt build-up, and day-to-day wear problems.

Smart, compact design provides High Accuracy at an affordable price

Benefits

- High accuracy and repeatability (±0.02% to ±0.05%)
- Permanently calibrated
- Direct replacement for encoders
- Non-contact length and speed measurement
  - -No slippage
  - -Non-marking
  - -Unaffected by material surface or color
- No moving parts to wear out
- Low cost of ownership
- Compact, rugged industrial sensor operates on +24VDC
- "Smart" gauge—optics, electronics and I/O in the gauge

Range of Applications

LaserSpeed gauges are well suited for a range of applications, including, but not limited to, measuring length and speed of:

- Paper and corrugated products
- Web products
- Non-woven products
- Plastic films and tapes
- Building materials
- Packaging
- Carpet
- Labeling
- Wire and cable
- Pipe and tube

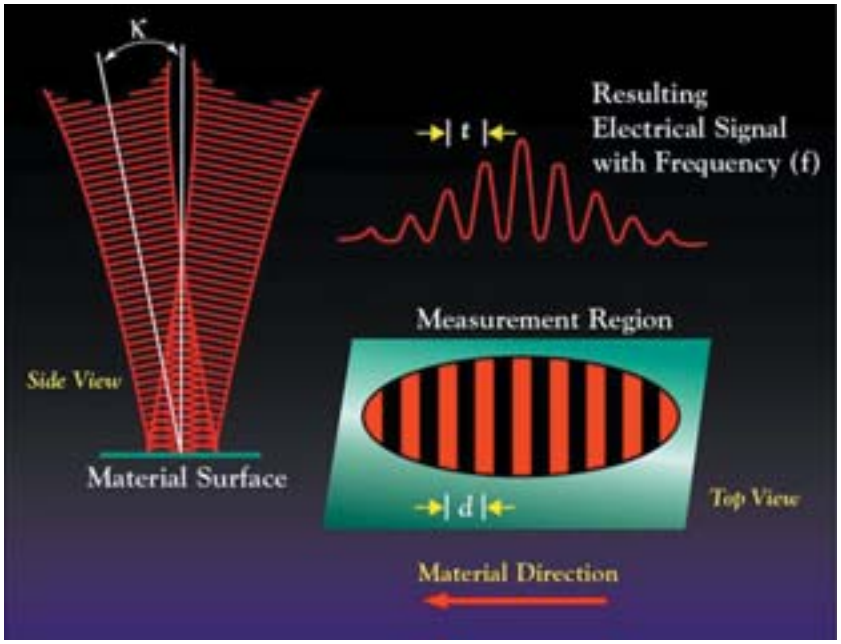
LaserSpeed®

Contact Encoders vs. LaserSpeed

Contact encoders are typically used in manufacturing applications for length and speed measurement. However, there are a variety of problems with the use of contact length measurement that can be avoided by replacing encoders with LaserSpeed:

Normal Tachometer Problem:	LaserSpeed Solution:
1. Measurement errors and inaccuracy caused by: product slippage, dirt build-up, day-to-day wear problems	Non-contact measurement ensures high accuracy and repeatability
2. High cost of ownership due to the need to regularly replace parts and recalibrate	Use of 100% solid-state digital technology with no moving parts ensures permanent calibration and low cost of ownership
3. Contact measurement can mark or damage the product	Non-contact measurement ensures no marking or damage of the product

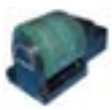
Laser Doppler Velocimetry Principle



LaserSpeed uses dual-beam laser interferometer technology to measure product velocity (speed), which is integrated over time to measure length.

Accessories

Airwipe and Quick-Change Window
Designed for a dirtier environment, the airwipe and quick change window help to ensure minimal downtime for cleaning.



Zero-Speed/Directional Wheel
Provides input to the LaserSpeed for handling a stopped or reversing line.
(LS4000 only)

Breakout Box/Power Supply
Provides easy access to all gauge inputs and outputs. Also provides power to the LaserSpeed.

Environmental Housing
Provides heavy-duty, double-sealed protection against hot and humid environments.

Accessory Case
A convenient case to hold the LaserSpeed and all accessories safe and secure.

	-301 (LS4000 only)	-303	-306	-310
Standoff Distance	100 mm (4 in.)	300 mm (12 in.)	600 mm (24 in.)	1000 mm (39.4 in.)
Speed Range: LS4000/LS8000	0.2 to 1700 m/min (0.7 to 5500 ft/min)	0.4 to 4000 m/min (1.3 to 13100 ft/min)	0.8 to 8000 m/min (2.6 to 26200 ft/min)	1.0 to 12000 m/min (3.2 to 39400 ft/min)
Speed Range: LS9000	-1700 to 1700 m/min (-5500 to 5500 ft/min)	-4000 to 4000 m/min (-13100 to 13100 ft/min)	-8000 to 8000 m/min (-26200 to 26200 ft/min)	-12000 to 12000 m/min (-39400 to 39400 ft/min)
Measurement Depth of Field	15 mm (0.6 in.)	35 mm (1.4 in.)	50 mm (2 in.)	100 mm (3.0 in.)

	LS4000-3 (Uni-directional)	LS8000-3 (Discrete Parts)	LS9000-3 (Zero Speed & Bi-directional)
Measurement Rate	20000/s	50,000/s	100,000/s
Starting/ Ending Length Correction	- No	- Yes	- Yes
Serial I/O	- RS-232	- RS-232/RS-422	- RS-232 / RS-422
Data Available	- Speed, Length - Quality Factor, Status	- Speed, Length - Quality Factor, Status	- Speed, Length - Quality Factor, Status
Baud Rate	- 115K, 230K, 19.2K, 38.4K, 57.6K 9.6K, 4.8K	- 115K, 230K, 19.2K, 38.4K, 57.6K 9.6K, 4.8K	- 115K, 230K, 19.2K, 38.4K, 57.6K 9.6K, 4.8K
Status via Serial I/O or Optional Ethernet	- Laser at Temperature - Laser On - Shutter Open - Gauge Temperature	- Laser at Temperature - Laser Interlock - Shutter Position - Valid Measurements - Material Present - System Ready	- Laser at Temperature - Laser Interlock - Shutter Position - Valid Measurements - Material Present - System Ready
Quadrature Pulse	- Opto isolated	- Opto isolated	- Opto isolated
Output 1	- Scaleable pulse amplitude (5-24V) - Fixed at 1000 pulses/unit - 250 KHz max pulse rate	- Scaleable pulse amplitude (5-24V) - Selectable pulses/unit - 250 KHz max pulse rate	- Scaleable pulse amplitude (5-24V) - Selectable pulses/unit - 250 KHz max pulse rate
Output 2	- Scaleable pulse amplitude (5-24V) - Selectable pulses/unit - 250 KHz max pulse rate	- RS-422 Drivers - Selectable pulses/unit - 5 MHz max pulse rate	- RS-422 Drivers - Selectable pulses/unit - 5 MHz max pulse rate
Index pulse output	- Yes/programmable	- Yes/programmable	- Yes/programmable
Gauge Power	- 24VDC (+/-4 VDC) @ 1.5 Amp - 50 mV ripple max	- 24VDC (+/-4 VDC) @ 1.5 Amp - 50 mV ripple max	- 24VDC (+/-4 VDC) @ 2.5 Amp - 50 mV ripple max
Gauge Size	203 x 159 x 81mm (8.0 x 6.3 x 3.2in.)	203 x 159 x 81mm (8.0 x 6.3 x 3.2in.)	203 x 159 x 95.2mm (8.0 x 6.3 x 3.75in.)
Gauge Weight	2.55 kg (5.6 lbs)	3.13 kg (6.9 lbs)	3.4 kg (7.5 lbs)
Temperature Range	-5 to 45ºC (21 to 113ºF)	-5 to 45ºC (21 to 113ºF)	- 5 to 45ºC (21 to 113ºF)
Output Rate	2 to 32 ms in 2 ms increments	1 to 2000 ms in 1 ms increments	1 to 2000 ms in 1 ms increments
Spot Size	- 3 x 5 mm - 1.75 x 5 mm L Version	- 3 x 5 mm (-310: 3 x 7) - 1.75 x 5 mm L Version	- 3 x 5 mm (-310: 3 x 7)

All LaserSpeed Gauges

Acceleration Rate	>500 m/s^2
Repeatability	+/-0.02%
Accuracy	<+/-0.05% of reading
User Isolated Voltage	5 to 24 VDC (300mA)
Relative Humidity	Non-condensing
Units of measure	Selectable
Speed	m/min, m/s, ft/min, ft/s, in/min, mm/sec, yards/in, yards/sec
Length	m, ft, in, yards
Analog Output	- 0-2V - Velocity or quality factor

Cooling*	
Air	- Pressure: Less than 70 kPa (< 10 PSI) - Flow Rate: 50 l/min (2 SCFM) Typical
Water	- Pressure: Less than 207 kPa (< 30 PSI) - Flow Rate: 1.0 to 3.8 l/min (0.26 to 1 gpm) 1.5 l/m (0.4 gpm) Typical - Coolant Temp: 5 to 45°C (41 to 113°F)
Ethernet -Optional	- 10/100, UDP, TCP, Telnet - Speed, Length, Quality Factor, Status
Degree of Protection	IP67
Temperature Range	-5 to 45ºC (21 to 113ºF)

***For ambient temperatures beyond gauge specification.**

This unit is a class 3B laser product and Complies with EN60825-1:2001. Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.

The following safety features required to comply with the Bureau of Radiological Health Class IIIB laser requirements are included:

- Key-operated power switch on optional controller
- Laser indicator light on supply and laser
- Delayed laser startup-laser indicator light on prior to laser radiation
- Laser beam blocking device
- Interlock capability for remote shut-off

BETA LaserMike

Beta LaserMike USA
8001 Technology Blvd.
Dayton, OH 45424 USA
Ph: +1 937 233 9935
Fax: +1 937 233 7284

Beta LaserMike Europe
Unit 3, First Avenue
Globe Park, Marlow
Buckinghamshire, SL7 1YA
United Kingdom
Ph: +44 1628 401510
Fax: +44 1628 401511

Beta LaserMike Asia
Unit 401, Xinmao Plaza,
Building 9,
No. 99 TianZhou Rd.
Shanghai 200233, China
Ph: +86 21 6113 3688
Fax: +86 21 6113 3616

Visit our website at: www.laserspeedgauge.com