

## LS9000 Series

*Designed for steel and non-ferrous metal manufacturing. Provides high accuracy at a revolutionary price.*

A breakthrough in electro-optics design enables Beta LaserMike's LaserSpeed® 9000 Series gauge to produce highly accurate, non-contact speed and length measurements, including zero speed and automatic direction detection, at a surprisingly low cost. To accomplish this, the LS9000 Series gauges use an enhanced version of autocorrelation, coupled with an Acusto-Optical modulator.

The LS9000 Series gauge is an industrial smart sensor that can be connected directly to a PLC or control computer. Speed, length, quality factor and gauge status information can be obtained via quadrature pulses, analog signals, serial communications and ethernet. With accuracy better than  $\pm 0.05\%$ , the LS9000 is the ideal gauge for replacing contact tachometers which are prone to measurement errors caused by slippage, dirt build-up, and day-to-day wear problems in the metal manufacturing industry.

**LS9000:** For normal environments (shown above right).

- Steel Slabs
- Plate Length
- Process Lines
- Cold Steel Strip
- Tube Length
- Painting Lines
- Steel Bar Length
- Bar Length
- Galvanizing Lines

**LS9000E:** For harsh, dry environments.  
(A LS9000 gauge inside an environmental housing)

- Temper/Skin Pass Mills
- Foil Mills
- Slitter Lines
- Slabs
- Galvanizing Line
- Cold Steel Strip
- Annealing Line
- Bar Mills
- Painting Line
- Profile Mills
- Processing Lines
- Tube Mills
- Wire Rod Mills
- Plate Mills



**LS9000X:** For harsh, wet or hot environments.  
(A LS9000 gauge inside a stainless steel housing)

- Hot Rolling Steel Mills
- Interstand Cold Rolling Steel Mills
- Heavy Steam Applications
- Extreme Hot and Hostile Environments



**LaserSpeed**

**Non-Contact Speed  
& Length Gauges**

**With Zero Speed  
and Automatic  
Direction Detection!**



### Benefits

- High accuracy and repeatability
- Rugged, sealed industrial packaging for use in industrial environments
- Non-contact length and speed measurement
  - No slippage
  - Non-marking
  - Not affected by material surface or color
- Measures zero speed
- Automatic direction detection
- Permanently calibrated
- Opto-isolated programmable pulse outputs
- Analog output for speed or status
- Compact, rugged industrial sensor operates on +24VDC



**BETA LaserMike**

Visit our website at:  
[www.betalasermike.com](http://www.betalasermike.com)

## Specifications

LS9000	-303	-306	-310	-315	-320	-325
<b>Standoff Distance</b>	300 mm (12 in.)	600 mm (24 in.)	1000 mm (39.4 in.)	1500 mm (59.1 in.)	2000 mm (78.1 in.)	2500 mm (98.4 in.)
<b>Speed Range</b>	0..+/-4000 m/min (0..+/-13100 ft/min)	0..+/-8000 m/min (0..+/-26200 ft/min)	0..+/-12000 m/min (0..+/-39400 ft/min)	0..+/-19000 m/min (0..+/-62400 ft/min)	0..+/-20000m/min (0..+/-65600ft/min)	0..+/-20000m/min (0..+/-65600ft/min)
<b>Measurement Depth of Field</b>	35 mm (1.4 in.)	50 mm (2.0 in.)	100 mm (4.0 in.)	200 mm (8.0 in.)	200 mm (8.0 in.)	200 mm (8.0 in.)

### LS9000 General Specifications

#### Accuracy

Depth of Field <75mm	<+/-0.05% of reading
Depth of Field >75mm	<+/-0.1% of reading

#### Repeatability

+/-0.02%

#### Measurement Rate

>100,000/s

#### Acceleration Rate

>500 m/s<sup>2</sup>

#### Starting/ Ending Length Correction

- Yes

#### Serial I/O

Data Available	- RS-232 / RS-422 - Speed, Length - Quality Factor, Status
Baud Rate	- 115K, 230K - 19.2K, 38.4K, 57.6K

#### Ethernet -Optional

- 10/100, UDP,TCP  
- Speed, Length  
- Quality Factor, Status

#### Status via Serial I/O or Optional Ethernet

- Laser at Temperature  
- Laser Interlock  
- Shutter Position  
- Valid Measurements  
- Material Present  
- System Ready

#### Quadrature Pulse

Output 1	- Opto isolated - Scaleable pulse amplitude (5-24V) - Selectable pulses/unit - 250 KHz max pulse rate
Output 2	- RS-422 Drivers - Selectable pulses/unit - 5 MHz max pulse rate

#### Gauge Power

- 24VDC (+/-4 VDC) @ 2.0 Amp

#### Gauge Temperature

- 5 to 45°C (41 to 113°F)

Specifications are subject to change without notice.

This unit is a class IIB 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 IIB 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

### LS9000

#### Gauge Size

-303, -306, -310	203 X 159 X 95.2 mm (8.0 X 6.3X 3.75 in.)
-315, -320, -325	228.6 X 159 X 95.2 mm (9 X 6.3 X 3.75 in.)

#### Gauge Weight

-303, -306, -310	3.4 kg (7.5 lbs)
-315, -320, -325	3.7 kg (8.3 lbs)

#### Water Cooling

1.0 to 3.8 l/min, Typical 1.5 l/min (0.4 gpm)

#### Relative Humidity

Non-condensing

#### Degree of Protection

IP67

### LS9000E

#### Gauge Size

-303, -306, -310	362 X 229 X 154 mm (14.25 X 9 X 6 in.)
-315, -320, -325	362 X 229 X 154 mm (14.25 X 9 X 6 in.)

#### Gauge Weight

-303, -306, -310	18 kg (40 lbs)
-315, -320, -325	Varies depending on Air Wipe/Air Purge

#### Environment Temp.

-10 to 150°C (14 to 302°F)

#### Water Cooling

1.0 to 3.8 l/min (0.26 – 1gpm)

#### Compressed Air

Air wipe	Instrument grade 50 l/min (1.8 cfm) Typical
Air Purge	6.2 – 8.3 Bar, 1200 l/min (90 -120psi, 45 scfm)

#### Relative Humidity

Non-condensing

#### Degree of Protection

IP67

### LS9000X

#### Gauge Size

-303, -306, -310	508 X 327 X 186 mm (20 X12.88 X 7.32 in.)
-315, -320, -325	508 X 327 X 186 mm (20 X12.88 X 7.32 in.)

#### Gauge Weight

-303, -306, -310	24.9 kg (55 lbs)
-315, -320, -325	24.9 kg (55 lbs)

#### Environment Temp.

-10 to 200°C (14 to 392°F)

#### Water Cooling

1.0 to 3.8 l/min (0.26 – 1gpm)

#### Compressed Air

Air wipe	Instrument grade 50 l/min (1.8 cfm) Typical
Air Purge	6.2 – 8.3 Bar, 1200 l/min (90 -120psi, 45 scfm)

#### Relative Humidity

Non-condensing

#### Degree of Protection

IP67

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