Declaration of Conformity

For products which fall under the scope of the Low Voltage (2006/95/EC) and EMC (2004/108/EC) Directives

Conformity is declared to the essential requirements/objectives of the directives

Manufacturer’s Name: Beta LaserMike USA
Manufacturer’s Address: 8001 Technology Blvd, Dayton OH 45424

Equipment: LaserSpeed Model LS4000-3, LS8000-3, LS9000-3

Safety Standards:
EN 61010-1:2010

EMC Standards:
EN 61326-1:2006
EN 61000-6-2:2005, EN 61000-6-4:2006-07

Limitations as to use:
Heavy Industrial Environment

We, the undersigned, hereby declare that the equipment specified above conforms to EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.

Manufacturer

<table>
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<tr>
<th>Signature</th>
<th>Dan Norris</th>
</tr>
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<tbody>
<tr>
<td>Full Name</td>
<td>Director of Engineering</td>
</tr>
<tr>
<td>Date</td>
<td>21 February 2013</td>
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Proprietary Statement

Manufacturer/Distributor

Beta LaserMike, 8001 Technology Blvd., Dayton, OH 45424, USA

About This Manual

This manual contains descriptions, drawings, and specifications for a Beta LaserMike product. Equipment or products made prior to or subsequent to the publication date of this manual may have parts, features, options, or configurations that are not covered by this manual. Specifications contained herein are subject to change by Beta LaserMike without prior notice. Beta LaserMike is not responsible for errors or omissions that may be contained herein or for incidental or consequential damages in connection with the furnishing or use of this information. Comments or suggestions for possible improvements to the manual are appreciated. Please email us at manualfeedback@betalasermike.com.

The information contained in this manual is the property of Beta LaserMike. The information disclosed in this document is furnished in confidence and upon the condition that individual and corporate intellectual rights, whether patented or not, will be respected. If this document is supplied on removable media (e.g. CD), an electronic copy (stored on-site) and one printout is permitted. If this document is supplied in printed form, no part of this document may be reproduced or scanned without the prior written consent of Beta LaserMike. This document may not be distributed or circulated to third parties.

Limited Warranty

Beta LaserMike will correct by repair, or at Beta LaserMike’s option, by replacement, F.O.B Beta LaserMike’s plant, any defect in workmanship or material in any equipment manufactured by Beta LaserMike which appears under normal and proper use within twelve months from the date of shipment (eighteen months for OEM’s), provided Beta LaserMike is given reasonable opportunity to inspect the alleged defective equipment at the place of its use and under conditions of its use.

EXCLUSIONS: This warranty does not cover products which have been modified, altered, or repaired by any other party than Beta LaserMike or its authorized agents. Furthermore, any product which has been, or is suspected of being damaged as a result of negligence, misuse, incorrect handling, servicing, or maintenance; or has been damaged as a result of excessive current/voltage or temperature; or has had its serial number(s), any other markings, or parts thereof altered, defaced, or removed will also be excluded from this warranty.

WARRANTY SERVICE AT CUSTOMER SITE: Warranty service performed at the customer’s facility will be free of charge for parts and labor; however, the customer will be liable for transportation and living expenses of personnel dispatched to effect such repair. A purchase order or other written confirmation of the acceptance of these charges, signed by an authorized individual, will be required prior to commencement of repairs. Additional charges may be assessed the customer if: 1) The equipment is not made available on a timely basis, 2) The equipment is found to be without fault, and/or 3) It is determined the equipment is not under warranty, whether by expiration of the warranty or any act which voids the warranty.

OTHER THAN AS SET FORTH HEREIN, BETA LASERMKE MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, OF MERCHANTABILITY AS TO THE EQUIPMENT MANUFACTURED BY IT, AND THERE ARE NO EXPRESSED OR IMPLIED WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE THEREOF. Beta LaserMike’s obligation to correct defects in such equipment by repair or replacement in accordance with the foregoing provisions is in lieu of any other warranties, expressed or implied, and in no event shall Beta LaserMike be liable for incidental or consequential damages. No service of Beta LaserMike’s equipment is permitted during the warranty period without the specific written consent of Beta LaserMike.
European Commission Requirements

This equipment is intended for use in a heavy industrial environment. The equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other equipment. There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other equipment the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orientate or relocate the equipment.
- Increase the separation between the pieces of equipment.
- Connect the pieces of equipment on separate mains circuits.
- Ensure that the relevant items of equipment are properly and securely earthed to a common earth point using adequately sized cable or other means of connection.

Where supplied or specified, shielded interconnection cables must be employed with this equipment to ensure compliance with the pertinent RF limits. Changes or modifications not expressly approved by the company could void the user’s authority to operate the equipment.

This product has been rigorously tested to comply with the European EMC (Electromagnetic Compatibility) Directive. With regard to this, Beta LaserMike recommends that any non-Beta LaserMike peripheral equipment is CE marked for the Heavy Industrial environment (EN50082-2). Beta LaserMike also recommends that any cables not supplied by Beta LaserMike, but used for powering Beta LaserMike equipment, be built using good EMC practices (i.e. cables with braided shield, and connectors with 360° termination of the braid to a metal/metalised shell connector at both ends). If you have any questions regarding this, contact the Beta LaserMike Service Department.
Safety Information

- Under NO circumstances should the earth safety connections be broken – internal damage to sensitive electronic components may occur and at worst electrocution to personnel may result.
- This equipment must be earthed/grounded.
- Relays and associated wiring are rated for SELV levels i.e. 60 VDC & 30 VAC RMS. These levels must not be exceeded.
- Maintenance, repairs and electrical connections should be performed by a suitably qualified person for the country of installation.
- Input power to the equipment is of direct current type designated by the symbol on equipment housing and shown below.

Reference: IEC 60417-5031

- The equipment contains a slow blow type fuse to protect against input power overloads and is not user replaceable.

Intended Use

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
Laser Classification

The Model LS9000 Non-contact Length and Speed Gauge (Model LS9000) is classified as a IIIb laser device. This category contains infrared and visible laser devices with powers up to 500 mW. The optical gauge in the system uses a 50 mW solid-state laser device operating between 760 and 800 nm (near infrared region of the spectrum).

A class IIIb product must have the following safety features:

- A 5-second delay after power-up before laser radiation is emitted from the gauge.
- An indicator light to inform personnel near the gauge that laser radiation is being emitted.
- A mechanical device to physically block the laser beam from exiting the gauge.
- An interlock circuit to shut off the laser when the circuit is opened.
- All hazards must be properly identified with warning labels.

These basic safety features are incorporated to promote safe operation of the laser.

A class IIIb laser must also have a key switch to power the laser, ensuring that only trained personnel can operate the instrument. Because the location of the gauge can often make it difficult to access a key switch, the key switch needs to be installed by the final user. It should be placed in a location that will be readily accessible to the operators. For more information on installing the laser key switch, see the Installing the System section of the Instruction Handbook.

The user of a laser device must comply with a different set of regulations. Many countries and individual states have passed legislation regarding the use of laser products.
The following system specifications will help establish appropriate safety measures.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Maximum Laser Power</td>
<td>0.050 watt</td>
</tr>
<tr>
<td>Laser Wavelength</td>
<td>0.785 micrometer</td>
</tr>
<tr>
<td>Minimum Laser Spot Size (Elliptical)</td>
<td>5 x 3 millimeters</td>
</tr>
<tr>
<td>Beam Divergence</td>
<td>0.5 milliradians</td>
</tr>
<tr>
<td>Pulse Rate</td>
<td>Continuous wave</td>
</tr>
<tr>
<td>Maximum radiance (power divided by spot-size area)</td>
<td>0.050 Watt / 0.1 cm² [0.5 W/cm²]</td>
</tr>
</tbody>
</table>

**Laser Safety Precautions**

The laser beam in the optical gauge is very powerful and can permanently damage eyes not protected by laser safety glasses. To avoid exposing yourself to hazardous radiation, you must take these precautions:

- **Never look into the laser beam. If you must look at the beam, view it from an angle and in the direction in which the beam is travelling.**
- **The beams emitted from the Model LS9000 are invisible to the unaided eye. Return the beam shutter to the closed position when the system is not in use or during setup.**
- **Ensure that all direct reflections are blocked.**
- **Remove all rings, watches, or jewellery from your hands when working on or near the gauge—can cause hazardous reflections.**
- **Never install the instrument at eye level.**
- **Operate the system only with people who have been instructed in laser safety.**
- **Post warning signs and lights that are active when laser is operating.**

If your country or state has no regulations governing the safe use of lasers, Beta LaserMike recommends that you follow the guidelines specified by the American National Standard for the safe use of lasers (ANSI Z136.1–1986). For a copy of this document, write to:

Laser Institute of America  
13501 Ingenuity Drive, Suite 128  
Orlando, Florida 32826  
1-800-345-2737
Labels and Safety Features

This section acquaints you with the advisory and identification labels on the instrument and the safety features incorporated into the design of the instrument. The following figures show the advisory and identification labels on the Model LS9000.

LS9000 Labels
Introduction

This manual describes the daily routine usage of the LaserSpeed 9000 Gauge. For installation and setup, see the LaserSpeed 9000 Instruction Handbook.

The Model LS9000 LaserSpeed® Non-Contact Length and Speed Gauge is an industrial, laser-based instrument that measures the velocity and length of moving material. Due to the nature of the laser-based measurement, there is no physical contact with the material.

Quick Start

The following will help you set up and operate the LS9000 for the first time. You can also use this information to check for possible connection problems during troubleshooting.

| Power Connection | The sensor requires 24 VDC of power at 1.5 amps. Connect +24 VDC to input pins 24 and 25 (+24V Power Input) on the 25-pin D-sub connector on the back of the LS9000 sensor. Connect the power ground to pins 12 and 13 (Power Ground for 24V Input) on the 25-pin D-sub connector on the LS9000 sensor. |
| Shutter Control   | Connect pin 17 (Shutter Control) to pin 11 (Signal Ground). This will open the shutter and permit the laser beams to exit the sensor. |
| Laser Interlock   | Connect pin 16 (Laser Interlock) to pin 21 (Signal Ground). This will power the laser. With +24 VDC connected and pin 16 (Laser Interlock) and pin 17 (Shutter Control) grounded, the laser will be visible on paper held in front of the LS9000 sensor. |
| RS232 Interface   | Connect the RS232 Cable from the 9 pin “D” connector on the Breakout terminal strip to the Comm port on your computer. The cable is a straight through cable without any pin reversal. The male end connects to the 9 pin connector on the terminal strip for the gauge and the female end connects to the computer. |

Run the LaserTrak system software. Check for proper RS232 connection at a baud rate of 115,200. If the interface fails, perform a search with the LS9000 software to make the connection. If the search fails, re-check all RS232 connections and search again. If the RS232 still is not working, try another computer. Some computers do not support a baud rate of 115,200.
LaserTrak Software

LaserTrak® is a Windows®-based software program, which allows you to acquire and display the Length, Velocity, Quality Factor, and Gauge Status in real time. The LaserTrak software configures the gauge’s operating parameters, displays data, and collects data, which can be stored on a computer hard drive. This LaserSpeed series of non contact speed and length gauges provide a set of versatile tools that are applicable for a wide variety of process measurement schemes. LaserTrak allows you to take full advantage of this versatility in a straightforward, easy to understand manner.

There are several features available with the LaserTrak software. LaserTrak mimics a chart recorder output on the screen and monitor the speed, length and Quality Factor in real time and presents a time history depiction of the data. LaserTrak can acquire and store data, and load and display stored data from a previously acquired data file.

LaserTrak also allows the configuration of the gauge operating parameters to optimize the gauge’s performance for each application. The gauge can emulate any mechanical pulse tachometer by using the gauge configuration feature. To configure the pulse outputs or any other parameter of the gauge, Click on “tools”, then click on “LaserSpeed Configuration”. Change the operating parameters to match your operating conditions and then save the parameters to the gauge by clicking on close. Once the parameters have been saved to the gauge you do not need the LaserTrak software to operate the gauge. However, LaserTrak software can be a very useful tool in getting familiar with the gauge’s operation and performance. It can be useful to monitor the gauge’s operation until you are comfortable with the gauge’s performance.

LaserTrak for Windows

Note: LaserTrak Version 4.0 or later must be used with the LS9000 gauge.

1) Make sure the RS232 cable is properly connected to the gauge and the computer. See the LS4000-3 Instruction Handbook if more information is needed.

2) Make sure the power is applied to the gauge.

® Windows 98, NT 2000 and Windows XP are registered trademarks of Microsoft Corporation.
3) Check status lights on the gauge. The power light should be on and the Laser on light should be on. This indicates that power has been applied to the gauge and the Interlock is closed so the Laser power can be applied.

4) Click on the LaserTrak Icon to start the LaserTrak Software.
   a) The LaserTrak software should search all COM ports on the computer and find the COM port that the gauge is connect to. Check the LS4000-3 Instruction Handbook for more information if the software does not find the gauge.
   b) Once communication has been established between the LaserTrak software and the gauge, the software will display the Chart Recorder screen.
   c) Click on “Tools” then “LaserSpeed Configuration” to go the configuration screen.
   d) Change the configuration settings to correspond to your application.
   e) Click Close and update the setting to the gauge.
   f) The gauge is now ready to start measuring.
Gauge Alignment

LaserSpeed gauges have a standoff distance and a depth of field the product needs to stay within in order to make measurements. The last two digits of the model number indicate the standoff distance. For example model LS9000-303, the last two digits are 03 meaning 300 mm (11.8 inches). See the LS9000 Instruction Handbook for more details. The 300 mm (11.8 inch) standoff means the product has to be 300 mm or 11.8 inches from the product. Model LS9000-303 also has a 37 mm or 1.45 inch depth of field. This means the product has to be 300 mm (11.8 inches) from the gauge ± 17.5 mm (±0.69 inches).

The laser beam needs to get aligned to the center 20% on round product. For flat products, the product just needs to be within the depth of field of the gauge. Normally, the gauge will be aligned perpendicular to the product. See the LS9000 Instruction Handbook for alignment error if not mounted perpendicular to the product.

The gauge should be making accurate speed and length measurements once the gauge has been mounted and aligned properly. The Speed and Length measurements along with Quality Factor can be monitored using a computer and the LaserTrak software.
The Chart Recorder Screen acquires Speed, Length, Quality Factor and Status from the gauge and displays them on a chart recorder screen.

**Chart Recorder Screen**

The Quality Factor represents how well the gauge is measuring the product. Quality Factor ranges from 0 to 15, with 15 being the best. Always try to get Quality Factor to equal 15. If Quality Factor is not 15, check the standoff distance, the alignment, make sure the product does not have any water on the surface. See the LS9000 Instruction Handbook for more details.
Servicing and Returning Your Equipment

Your instrument was carefully inspected electrically and mechanically prior to shipment. It should be free of surface mars and scratches, and it should be in perfect working order upon receipt. If any indication of damage is found, file a claim with the carrier immediately, prior to using the instrument. If no damage is apparent, proceed by using this manual to install and setup this instrument.

Save the shipping carton and packing material for future storing or shipment of the instrument. If, at some future time, the instrument must be returned to the factory for service, include a full description of the instrument failure and the mode of operation the instrument was in at the time of failure. Also include a contact person to discuss the instrument failure.

When returning equipment for service, it is important to first obtain a Return Material Authorization (RMA) number. The RMA number is needed for proper handling of returned equipment.

- To obtain an RMA, go to [www.betalasermike.com](http://www.betalasermike.com)
- Select Service
- Select Equipment Return / RMA from the drop-down menu. Follow the instructions to obtain an RMA.

Ship the instrument in the original carton, or, if the original carton is unavailable, ship in a carton providing sufficient protection. Send the instrument to the Asia, Europe, or USA office (addresses listed in the supplied Contacts/CE Compliance Manual), whichever is closest to you or to the office indicated by your sales engineer. Place the RMA number on the outside of the carton, and include a purchase order number and any other information specific to your instrument. Field warranty service is available, if the customer pays travel expenses by advance purchase order. All service operations should be performed by skilled electronics technicians, who have been trained by Beta LaserMike.