LaserLine Manufacturing, Inc.

GL3000PMC-E
OWNER’S MANUAL
Wing Plow & Guidance Alignment Laser
EU / IEC

US Patent No. 7,966,753
# GL3000PMC-E
## Owner’s Manual
### Wing Plow & Guidance Alignment Laser

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THE SYSTEM

The GL3000PMC-E Guidance Laser uses an “ultra-bright” green laser to establish wing plow trailing edge location before you get there.

The laser spot impacts on the road/snow surface ahead of the truck and shows the driver where the wing plow trailing edge will be. The laser reference spot is on the road and in the driver’s normal field of view.

The GL3000PMC-E is electronically designed for cold weather operation. This laser is coupled to a special heat source for the exit window to reduce or eliminate ice build-up on the front of the laser output lens. The GL3000PMC-E also has a unique pneumatic snow removal system incorporated with the laser housing that automatically fires a blast of air at the front of the laser lens every 5 seconds. This removes snow build-up from the laser output lens.

The laser housing is weatherproof, and hermetically sealed and dry nitrogen charged for operation in virtually any weather condition.

The systems work directly off the 12 volt side of the truck, and will operate from 12 to 24 DC with positive or negative ground.

THE PRODUCT

The GL3000PMC-E is a versatile all weather product that can also be used for guiding highway paint stripers, asphalt distributors, pavement profilers, or virtually any other vehicle or equipment requiring line control. Use it in the winter and summer for all your guidance needs.

Main Housing: Weatherproof, containing optic plate mounting platform, micro processor electronics, laser, laser mounting assembly, laser driver board, automatic cooling and heating system, front window is automatically heated to reduce or eliminate icing.

Pneumatic Air Blast Module: Removes snow build up from laser exit window with automatic air blast every 5 seconds.

Control Panel In Cab: Allows the operator to turn the laser on and off as well as the deicing and automatic air blast functions.

20 Feet (6.09 Meters) of Interconnect Cable: With waterproof mil spec in-line connector mounted between the laser main housing and the control panel mounted in the cab.

5 Feet (1.52 Meters) of 12V DC Cable: Running from control box for connection to vehicle’s 12V DC power.

20 Feet (6.09 Meters) of 1/4-Inch Pneumatic Hose Line: Complete with connectors for tying into vehicle’s secondary air source.

THE ADVANTAGES

- Cuts damage caused by plow strikes by 80 to 100%.
- Less strain on the driver.
- Reduces equipment down time.
- It’s much safer.
- It will save you money.
CONTROL BOX & POWER SUPPLY

CONTROL BOX

1 Key Switch
Controls power access.
Requires key to operate laser.

2 Main Power Switch
Turn on power, leave on entire shift.

3 Laser Mode Switch
*Redundant Dual LED Emission Indicator.*
1st depression = Laser on steady
2nd depression = Laser on blinking
3rd depression = Laser off

4 Deicer Switch
*Status light*
Leave on during freezing temperatures.

5 Remote Interlock Interface Port (optional)
Provides connection source for external laser shut off switch. Shown with Shorting Bar installed.

6 Shorting Bar - Remote Interlock Port
Remove if wiring the system for remote laser shut off.

7 Power Cable to Vehicle 12 or 24 VDC (15 feet)
White wire = +12 / 24 Vdc
Black wire = -12 / 24 Gnd
The GL3000PMC-E has reverse voltage protection.

8 Laser Control Cable
Connects control box to laser head.

9 Plow Position Sensor Wire (optional)
Connects to the hot wire on “power up gravity down” wing plow control systems.
The laser will turn on when the wing plow is down and off when the wing plow is up.
Acts as a further indicator to the driver of the plow position (along with visually checking the plow position and the plow status light on the plow control).

10 Protection 3 amp Fuse (3amp MAX)
**COMPONENTS & CONTROLS: GL3000PMC-E LASER**

11 **Vertical Aiming**  
Loosen to aim; retighten.

12 **Horizontal Aiming**  
Loosen to aim, retighten.

13 **Mounting Holes (2)**  
Two holes provided to mount laser to stable surface.

14 **Heated Laser Exit Window**  
Automatically heats entire front of laser to eliminate snow and ice.

15 **Pneumatic Snow Removal Module**  
Houses the pneumatic valve that sends an air blast automatically every 5 seconds to keep the Exit Window clear of snow and ice.

16 **Air Blast Nozzle**  
Directs air blast across the face of the Exit Window.

17 **Redundant Dual LED Emissions Indicator**

18 **Input Coupling from Air Supply**  
Accepts 1/4 inch pneumatic hose from filtered supply line.

19 **Mil Spec Connector**  
Connects control box to laser.

20 **Purge Valve Set at Factory**  
Do not tamper with. Will void warranty.

**WARNING!**  
Laser is filled with dry nitrogen to prevent moisture. Do not open or tamper with purge valve, front, rear or bottom covers. No user or non certified persons shall access interior of laser! Removal of covers will violate IEC Regulations and Factory Warranty.
MAINTENANCE

The only maintenance that may be required is:

1. Periodically clean the Exit Window of the GL3000PMC-E. Do this with a soft cloth. Do not use Kleenex or paper towels. Be careful not to scratch the glass.

2. Periodically blow the pneumatic lines to clear moisture from the system.

Note: Always turn off power to the laser when cleaning the Exit Window.

SERVICE

No service is required and no service is to be performed by the Customer. Only LaserLine Mfg., is authorized to perform laser service. Any opening, tampering with, or modifying the GL3000PMC-E Laser Housing by anyone other than LaserLine Mfg., Inc. will void the warranty.

Under no circumstances, attempt to open or disassemble the main Laser Housing.

The pneumatic air blast module may be opened for service or valve replacement. See page 3 item 10 for location.

INSTALLATION SUGGESTIONS

1. The laser must be mounted to a stable surface. If the laser base is vibrating (too flimsy a mount) on the vehicle, the vibration is magnified at the laser spot and can make it difficult to see. Stability of the laser mount is very important.

2. Do not mount the laser inside the cab and shoot the laser beam through the windshield without the use of a boot to prevent back scatter. Call the factory for details.

3. Do not mount the GL3000PMC-E laser unit in a location that allows the laser beam to be directed to hit any mirror-like reflective surfaces on the vehicle such as mirrors.
INSTALLATION & AIMING THE LASER FOR SNOW PLOWS

INSTALLATION
Mount the GL3000PMC-E Laser on the far right side (Fig. 1) of the vehicle (passenger side) on top of the cab, on the underside of the headache rack (Do NOT use the headache rack if it rides with the dump function, only if it is permanently attached to the frame), or to the rear view mirror mount if stable. If the plow trailing edge is on the driver’s side, mount the laser on the far left.

Run power to the 12 or 24V side of the electrical system, either tied to or separate from the ignition system. Note: Attach to minimum 10 amp circuit using minimum of 16 gauge wire.

If activating Plow Position Sensor see item 6 on page 3.

Run pneumatic line to secondary dry air source; i.e., under driver’s seat. A 40 micron air line filter on the pneumatic supply line to the laser is recommended.

AIMING THE LASER
With the Wing Plow in the down position (Fig. 2), measure the distance from the outside of the front and rear outside tire line to the outer edge of the Wing Plow trailing edge. Note: Front Wheels must be straight.

Extend the wheel line out about 60 feet (18 meters) in front of the vehicle (Fig. 3). Make sure the line is perfectly straight and in line with the outer wheel line. This should be done on a flat surface or continuous slope running fore and aft of the truck. Measure along the tire line out the distance in front of the truck that you want the laser spot to be (i.e., 50 feet or 15.24 meters). From that point, measure over to the right the width of the Wing Plow (i.e., 6 feet or 1.828 meters) plus about 6 to 12 inches (15 to 30 cm) for a cushion. Set the laser spot at that point and lock it down securely using the Adjustment Bolts on the Laser Housing.

The distance in front of the truck that you set the laser spot at depends on your own typical driving speed. This distance could be anywhere from 20 feet to 60 feet (6 to 18 meters) or more (Fig. 4).

![FIG. 1](image1)

![FIG. 2](image2)

![FIG. 3](image3)

![FIG. 4](image4)

<table>
<thead>
<tr>
<th>Driving Speed</th>
<th>Approximate laser spot distance from truck</th>
</tr>
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<tbody>
<tr>
<td>Mph</td>
<td>Kph</td>
</tr>
<tr>
<td>35</td>
<td>56</td>
</tr>
<tr>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>15</td>
<td>24</td>
</tr>
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SNOW PLOW OPERATION

1. A) **Turn on the Main Power Switch** 15-20 minutes prior to plowing. This puts the laser module in “preheat” to get the laser up to operating temperature. The laser status light (green light above laser mode switch) will slow-blink until the system is warmed up, and then on steady when the laser is activated.

   B) **Turn on the Deicer Switch** right after you turn on the main power switch. Leave this switch on for the entire shift. This switch activates both the anti-ice heater on the front of the laser module as well as the pneumatic air blast module for snow removal from the front lens.

2. **Do a visual check of the laser housing.** If the front of the unit is packed with snow and ice, wipe it off. It is not unlike your windshield: if it’s covered with snow and ice, you cannot see through it. The same is true for the laser: if the output lens is not clear, the laser will not go through (see through) it.

3. The GL3000PMC-E laser spot puts your trailing edge location ahead of you and shows you what you will hit if you do not take action. It virtually eliminates continually looking in the rearview mirror for trailing edge location.
   - The mirror shows what you **just** hit.
   - The laser shows you what you **will** hit!

   It cuts down on strikes and damage dramatically because it gives you a heads-up about where your plow trailing edge will be ahead of time.

4. The laser is effective at letting you know your plow location and whether or not you will clear an object on long shallow curves and straight runs. When going around corners, it will not work for you, but once around the corner it sets you up for your run relative to guard rail, bridge curb lip, abutments, mailboxes, etc.

5. The laser spot reference ahead of you is more visible or less visible depending on conditions. If it is bright and sunny, and you’re plowing slush, you probably will not see the laser spot, as water sucks out the color. Generally speaking, the worse the visibility and driving conditions are, the better it works for you, and that, of course, is when you need it the most.

6. **Laser Enhancement Glasses** (part number 3000-0435) block out glare and increase laser spot visibility for the driver in daylight operations.

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**DRIVING CONDITIONS USING THE LASER:**

The worse it gets, the better it works!
STRAIGHT ROAD
As indicated

OUTSIDE CURVE
More room than indicated

INSIDE CURVE
Less room than indicated
Laser
---
**Laser Source:** Nd: YAG

<table>
<thead>
<tr>
<th>Power</th>
<th>12 to 24 Volt DC Positive or Negative Ground</th>
</tr>
</thead>
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<table>
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<tr>
<th>Power Draw</th>
<th>4.00 Amps (Maximum Operating)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>0.03 Amps (Sleep Mode)</td>
</tr>
</tbody>
</table>

**Recommended Ambient**

<table>
<thead>
<tr>
<th>Operating Temperature</th>
<th>+36°F to +120°F / +2.2°C to +48.8°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature</td>
<td>-40°F to +150°F / -40°C to +65°C</td>
</tr>
</tbody>
</table>

**Laser Housing and Mount**

<table>
<thead>
<tr>
<th>Height</th>
<th>15.615 cm (6-3/8 Inches)</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
<td>18.655 cm (7-7/8 Inches)</td>
</tr>
<tr>
<td>Width</td>
<td>10.79 cm (4-1/4 Inches)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable Length From Laser Housing to Control Box</th>
<th>6.1 m (20 Ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 / 24 Volt Power Cable Length from Control Box</td>
<td>4.6 m (15 Ft)</td>
</tr>
</tbody>
</table>

| Shipping Weight | 11.34 kg (25 Lbs) |

**Laser Emission Information**

<table>
<thead>
<tr>
<th>Laser Source</th>
<th>Nd: YAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength</td>
<td>532 nm</td>
</tr>
<tr>
<td>Full Aperture Output Power</td>
<td>&lt;40 mW (35 mW Typical)</td>
</tr>
<tr>
<td>7mm Aperture Power at 20cm Distance</td>
<td>&lt;5 mW</td>
</tr>
<tr>
<td>Full Aperture Beam Diameter</td>
<td>&lt;25 mm</td>
</tr>
<tr>
<td>Beam Diameter 1/E2</td>
<td>14 mm</td>
</tr>
</tbody>
</table>

| Divergence   | <0.1 mrad |
|Beam Mode (Profile)| TEM00|

| Emission     | CW or 2 Hz |

**Laser Class EU**

**Laser Class USA**

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**GL3000PMC-E WARRANTY**

This product is guaranteed against defects in materials and workmanship with parts and labor, under normal working conditions from one year from the date of purchase, except as noted herein.

LaserLine Mfg., Inc. liability under this warranty is limited to repairing or replacing any product returned to an authorized service center for that purpose. Any evidence of attempts to repair this unit by other than factory authorized personnel automatically voids the warranty.

**Warning!** Under no circumstances, attempt to open or disassemble Laser Housing.

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**FACTORY SERVICE CENTER**
LaserLine MFG., INC.
1810 S.E. First Street, Suite H,
Redmond, OR 97756, USA
Phone: 1-541-548-0882
Fax: 1-541-548-0892
Email: Laserline@laserline.net

**FACTORY SERVICE:** New Product Warranty service policy for new products stated above.

**SERVICE WARRANTY:** 1 year on replacement Parts, 90 days on Labor.

**FOR ALL WARRANTY:** Call Order Processing for RMA # at 1-541-548-0882. The Unit will be repaired and returned by prepaid freight.

**NON-WARRANTY**
Send to: LaserLine MFG., INC. at above address.
CAUTION!

Do not expose this Laser to:

• High pressure washing
• Car wash

When cleaning front window, use window cleaner with paper towel or clean cloth. No abrasives.

Store in clean, dry environment when not in use.

WARNING!

Do not open or tamper with the purge valve, front, rear or top covers. Laser is filled with dry nitrogen to prevent moisture from damaging internal electronics and optics. No user access to interior components! Removal of covers will violate IEC/OSHA Regulations and Factory Warranty.
LASER SAFETY

The GL3000 Series Laser is a Class 3B Laser Product. Class 3B Lasers are used every day in construction and alignment applications. With every use, eye safety is a consideration.

The Operators of the laser are effectively the “Safety Persons”, and should think of themselves as the person responsible for preventing accidents and unwanted exposure.

The operation of Class 3B lasers are generally to be overseen by a Laser Safety Officer (LSO) in your facility or organization. For further data regarding suggested or required operating parameters consult the IEC 60825 family of standards and/or your national and local government safety organization.

Viewing or looking at the laser spot impacted on the road or highway is normal operating procedure for the GL3000 and is how the product is used for guidance applications. There is no danger or hazard to the Operator or Driver using the laser in this manner.

SAFETY CONSIDERATIONS:

- When installing the GL3000 Laser, do not mount the laser inside the cab and shoot the laser beam through the windshield. This is an unsafe practice as the laser beam can reflect back off the windshield into the Operator’s eyes (backscatter).
- Do not mount the GL3000 Laser in a location that allows the laser beam to be directed to hit any shiny or reflective surface on the vehicle, such as chrome, side mounted rear view mirrors, or glass surfaces.
- Class 3B Lasers are bright lights that can or may be aimed. Be aware of people and your surroundings.
- Therefore, think of the laser as the sun, something you do not stare back into. Do not look at the laser through optical devices, or look at it reflected off of shiny surfaces such as chrome, glass or mirrors.
- Viewing the laser beam or a reflection of the beam with optics, such as binoculars or cameras can be hazardous because they can gather or concentrate the laser right to the eye.
- Turn laser off in the event of potential exposures: i.e., stopped at a crosswalk in the vicinity of pedestrian traffic. Watch for the reflection off of bumpers, windows, etc.
- CAUTION! Use of controls or adjustments or performance of procedures other that those specified herein may result in hazardous radiation exposure.
- Do not open laser housing, no user serviceable parts inside. Service to be performed ONLY by manufacturer.
- Do not mount the GL3000PMC-E laser unit in a location that allows the laser beam to be directed to hit any mirror like surfaces on the vehicle such as mirrors.

GL3000PMC-E PRODUCT LABELING

Note: Maintain these labels in their proper locations.
CONTROLS & EMISSIONS

WARNING!
Laser is filled with dry nitrogen to prevent moisture. Do not open or tamper with purge valve, front, rear or bottom covers. No user or non certified persons shall access interior of laser! Removal of covers will violate IEC Regulations and Factory Warranty.

CONTROL PANEL
1 Key Switch
2 Main Power Switch
   Turn on power, leave on entire shift.
3 Laser Mode Switch
   Dual LED Emission Indicator.
   1st depression = Laser on steady
   2nd depression = Laser on blinking
   3rd depression = Laser off
4 Deicer Switch
   with status light
5 Remote Interlock Interface Port
   Shown with Shorting Bar.
6 Power Cable to Vehicle 12 or 24 VDC (15 feet)
7 Laser Control Cable
8 Plow Position Sensor Wire
   The laser will turn on when the wing plow is down and off when the wing plow is up.
9 Vertical Aiming
10 Horizontal Aiming
11 Redundant Dual LED Emissions Indicator
12 Laser Control Cable Receptacle

LASER SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser Source</td>
<td>YAG</td>
</tr>
<tr>
<td>Wavelength</td>
<td>532nm</td>
</tr>
<tr>
<td>7mm Aperture Power at 20cm Distance</td>
<td>&lt; 5mW</td>
</tr>
<tr>
<td>Diameter</td>
<td>25mm</td>
</tr>
<tr>
<td>Divergence</td>
<td>&lt; 0.1mrad</td>
</tr>
<tr>
<td>Emission</td>
<td>CW or 2Hz</td>
</tr>
<tr>
<td>Laser Class EU</td>
<td>3B</td>
</tr>
<tr>
<td>Laser Class USA</td>
<td>IIIa</td>
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</table>

WARNING!
Laser is filled with dry nitrogen to prevent moisture. Do not open or tamper with purge valve, front, rear or bottom covers. No user or non certified persons shall access interior of laser! Removal of covers will violate IEC Regulations and Factory Warranty.