



INSTRUCTION MANUAL

Smart Proximity Detection System (SPDS) User Manual
Vehicle Tag (VT) & Pedestrian Tag (PT)



Table of contents

- Section 1: What Is SPDS?**
- Section 2: Safety Information**
- Section 3: Component Names**
- Section 4: Specifications**
- Section 5: Installation**
- Section 6: Vehicle Indicator Setting Adjustment**
- Section 7: Pedestrian Tag Setting Adjustment**
- Section 8: How to use**
- Section 9: Troubleshooting**
- Section 10: Frequently Asked Questions**
- Section 11: Regulatory Information**



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Introduction

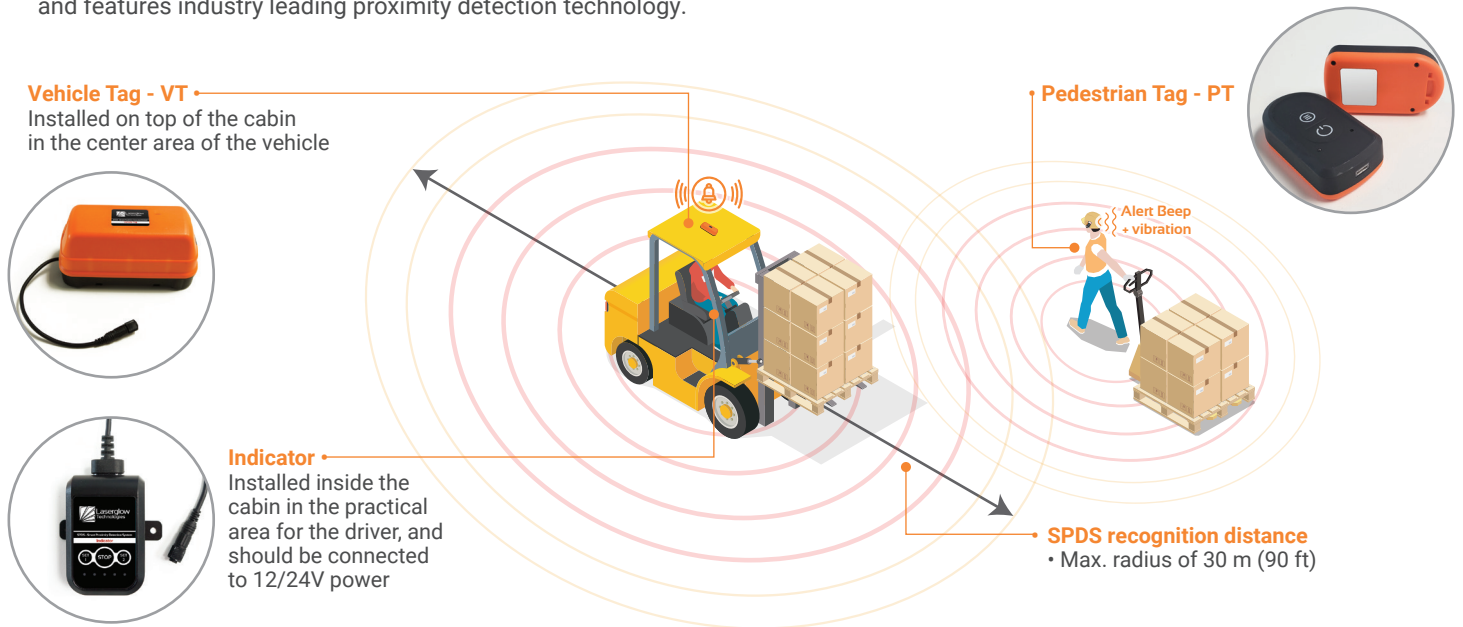
Thank you for purchasing Laserglow's SPDS product.

This product is a safety-assisting device to give warning signals by detecting the proximity of vehicles and pedestrians at industrial work sites. Laserglow will not be held responsible for any personal injury or property damage caused by improper use. Before using this product, please read this manual carefully



What is SPDS?

Laserglow's Smart Proximity Detection System (SPDS) is an intelligent proximity alert safety system that prevents collisions by alerting the operator of danger using 2 way communication to both drivers and pedestrians. This includes when a pedestrian approaches a vehicle or when a vehicle approaches another vehicle. It is easy to install without causing any damage to vehicles, and features industry leading proximity detection technology.



SPDS can be used with all industrial vehicles (excavators, forklifts, loaders, tractors, etc.).



Safety Information

Caution! Failure to observe the precautions in this manual may result in damage to property or serious personal injury.



Use only 12 V or 24 V DC to power the Vehicle Tag (VT) and Vehicle Indicator (VI). For vehicles with 36 V or 48 V DC power, a DC-DC stepdown converter must be used.



Do not immerse the products in water or place under running water. Doing so will result in permanent damage not covered under warranty.



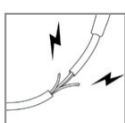
Do not store or use the products near flammable materials or other sources of heat such as smelting equipment, cooking appliances, or open flames.



If the product begins to produce smells, smoke, or make abnormal noises, disconnect power immediately and call Laserglow for assistance.



Do not touch the electrical connectors or wiring with wet hands, as this may cause electric shock or fire. If the electrical connectors or wiring get wet, wipe with a dry towel. Leaving water or other liquids on these components may result in electric shock or fire.



Do not place heavy objects on the products or on electric wiring as this may cause damage that could result in electric shock or fire.



Do not disassemble or modify the products. There are no user-serviceable parts inside. Disassembling the products may result in damage or electric shock, and products damaged from disassembly will not be covered by warranty.

Usage Precautions

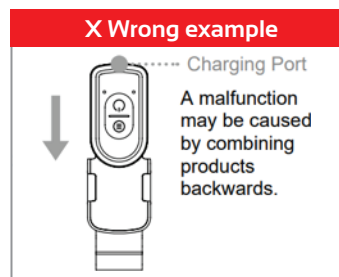
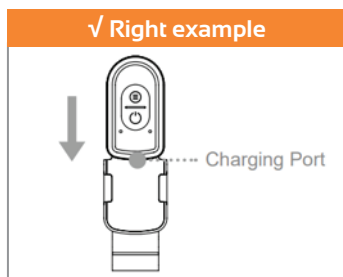


The Pedestrian Tag (PT) includes an internal rechargeable Lithium Polymer battery. The battery is not user replaceable. Attempting to replace the battery will void warranty and may result in malfunction, fire, or explosion.



Store the Pedestrian Tags (PTs) in a cool, dry location away from direct sunlight when not in use.

Take care when attaching the Pedestrian Tag (PT) to the helmet clip that the orientation is correct. The flatter side should slide into the clip first. If the PT is not secured properly it may fall and be damaged.





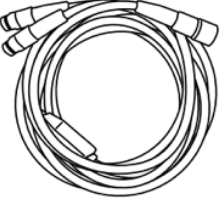
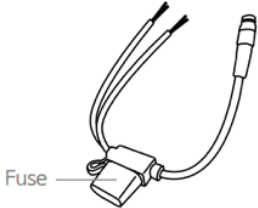

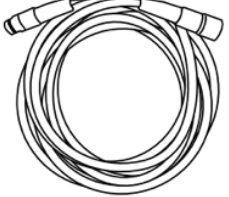





Any accidents caused by failure to observe the safety information are the responsibility of the user.

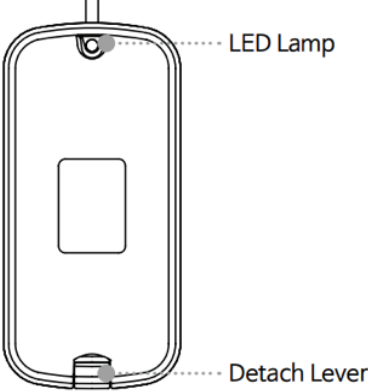
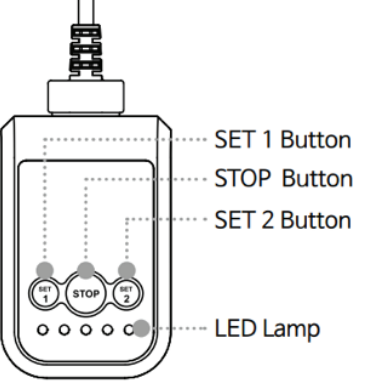
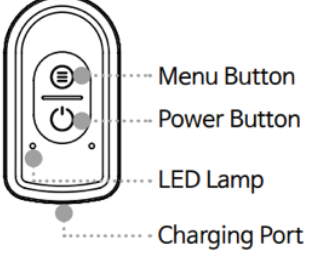


Component Names

COMPONENTS:




<p>Vehicle Tag (VT)</p> 	<p>Indicator</p> 	<p>Pedestrian Tag (PT)</p> 	<p>Helmet Holder</p> 
<p>Cable Harness (6m)</p> 	<p>Open Wire Adapter Cable</p>  <p>Fuse</p>	<p>User Manual</p> 	<p>Extension Cable</p> <p>OPTIONAL</p> 
<p>High Speed Charging Cable (PT)</p> <p>OPTIONAL</p> 	<p>Car Adapter</p> <p>OPTIONAL</p> 	<p>Armband</p> <p>OPTIONAL</p> 	

COMPONENT PART NAMES:

<p>Vehicle Tag (VT)</p>  <p>LED Lamp</p> <p>Detach Lever</p>	<p>Indicator</p>  <p>SET 1 Button</p> <p>STOP Button</p> <p>SET 2 Button</p> <p>LED Lamp</p>	<p>Pedestrian Tag (PT)</p>  <p>Menu Button</p> <p>Power Button</p> <p>LED Lamp</p> <p>Charging Port</p>
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Component Names

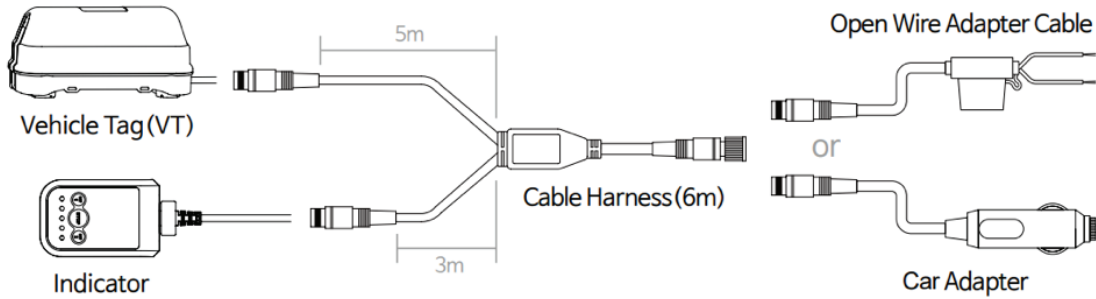
Specification	Vehicle Tag (VT)	Vehicle Indicator (VI)	Pedestrian Tag (PT)
Product Image			
Input Voltage	12/24 V DC (9-32 V DC)	12/24 V DC (9-32 V DC)	-
Current Draw	300 mA	500 mA	-
Interface	CAN Bus 2.0	CAN Bus 2.0	-
Alert Method	Red/green LED Flashing	Red/green LED flashing + spoken warning	Vibration, audible alarm, or both
Sound Level @ Distance	-	92 dB @ 10 cm	87 dB @ 10 cm
Battery	-	-	950 mAh Lithium polymer
Charging Interface	-	-	USB Micro-B (5V/1A)
Charge Time	-	-	~1.5 hours
Charge Current	-	-	850 mA
Operating Time	-	-	6 days (at 8 hours/day)
Size	177.8 x 84.1 x 86 mm	93 x 130.5 x 47.5 mm	40 x 72 x 19.5 mm
Weight	444 g	207 g	58.5 g
Mounting Style	Magnetic or zip ties	Screws/bolts or double-sided tape	Helmet clip or arm band
Operating Temperature	-30 to 85 °C	-30 to 85 °C	-20 to 55 °C
Storage Temperature	-40 to 85 °C	-40 to 85 °C	-20 to 55 °C
Waterproofing	IP65	IP65	Water resistant
Available Colors	-	-	-
Standard Warranty	12 months	12 months	12 months

Some features may change without notice.

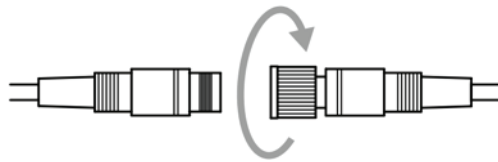


Installation

Caution! It is highly recommended to install the Vehicle Tag (VT) and Vehicle Indicator (VI) while the vehicle power is off to avoid the possibility of electric shock.

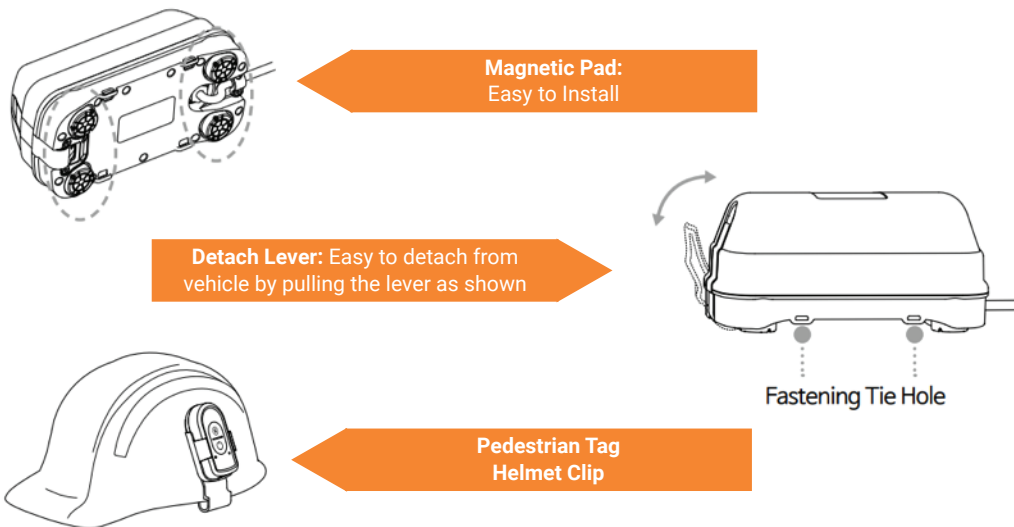


Fully tighten cable connections to ensure a good connection and water-tight seal.



Installation Tip: It is best to install the Vehicle Tag (VT) on the top of the vehicle cabin, or any position where there is a 360° unobstructed view. Installing the Vehicle Tag in an area where line of sight is obstructed may reduce system reliability.

Laserglow's SPDS is designed with the customer in mind for easy installation without the help of a professional installer. The powerful magnet on the bottom of the Vehicle Tag (VT) attaches easily and securely to vehicles and can be easily detached using the detach lever. In situations where there is no magnetic surface, the Vehicle Tag (VT) can also be secured with zip ties.

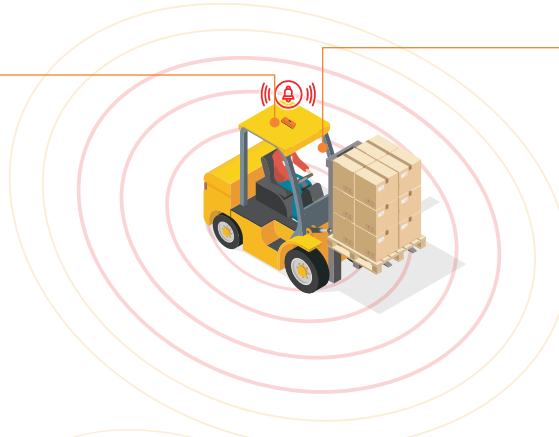




Installation Spot

Vehicle Tag - VT

Installed on top of the cabin in the center area of the vehicle



Indicator

Installed inside the cabin in the practical area for the driver, and should be connected to 12/24V power



2 Vehicle Tags - VT

Due to the size, 2 VTs are Installed on the front and rear of the vehicle



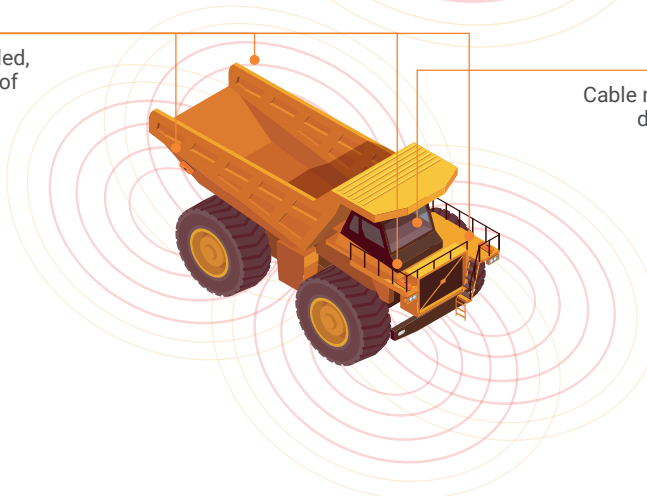
Indicator

Installed inside the cabin in the practical area for the driver, and should be connected to 12/24V power



4 Vehicle Tags - VT

Due to the size, 4 VTs are Installed, 2 on the front and 2 on the rear of the vehicle



Indicator

Cable maximum connectable distance: 50 m (150 ft)



Caution prior to VT installation

- Due to UWB's frequency features, VT cannot penetrate any metal plate.
- In case of VT being installed on top of tall vehicles, VT cannot recognize a pedestrian even with a PT attached.





Vehicle Indicator Setting Adjustment

Danger / Caution Distance Setting

This setting can be disabled by Laserglow at customer request to prevent users from making adjustments without authorization. Note that the distance setting adjustment can only be accessed while the device is in normal operation (not in an alarm state). Adjustment of the Danger and Caution distances is performed in the following order:

1. Set Pedestrian Tag Danger distance
2. Set Pedestrian Tag Caution distance
3. Set Vehicle Tag Danger distance
4. Set Vehicle Tag Caution distance

1. Press and hold the SET 1 and SET 2 buttons simultaneously for 2 or more seconds
2. Set the Pedestrian Tag Danger distance by pressing SET 1 or SET 2 until the desired distance is displayed on the device
3. Press the STOP button to save the setting and move to the next setting
4. Set the Pedestrian Tag Caution distance by pressing SET 1 or SET 2
5. Press the STOP button to save the setting and move to the next setting
6. Repeat steps 2-5 for the Vehicle Tag Danger and Caution distances



SET 1 button: Distance - 2 m

STOP button: OK

SET 2 button: Distance + 2 m

2 m space per LED lamp [● ON ○ OFF]

● ○ ○ ○ ○ : 2 m or 1 m

● ● ○ ○ ○ : 4 m or 3 m

● ● ● ○ ○ : 6 m or 5 m

● ● ● ● ○ : 8 m or 7 m

● ● ● ● ● : 10 m or 9 m



Distance setting can be set to even distances [2 / 4 / 6 / 8 / 10 meters] or odd distances [1 / 3 / 5 / 7 / 9 meters]. The default setting is even distances. To change to odd distances, press and hold SET 1 and STOP at the same time. The LEDs will flash in this configuration to confirm the settings:



To change from odd distances back to even distances, press and hold SET 2 and STOP at the same time. The LEDs will flash in this configuration to confirm the settings:



Setting Tip: The SPDS detects proximity every 0.5 seconds. Fast moving vehicles can cover large distances in 0.5 seconds – a vehicle moving at 30 km/h will move over 4 meters during that time. If the danger or caution distance is set to 4 meters, a collision could occur before the SPDS alert will sound. As a result, **vehicle top speed must be considered when setting the proximity distances.**

Volume Adjustment

Note that the volume adjustment can only be accessed while the device is in normal operation (not in an alarm state). Press the SET 1 button to decrease the volume. Press the SET 2 button to increase the volume.



Restore Default Settings

To reset the settings back to the factory defaults:

1. Press and hold the SET 1, SET 2, and STOP buttons for 3 seconds.
2. When the red LED flashes sequentially, press and hold the STOP button again for 2 or more seconds.
3. The LEDs will turn off, default settings will be restored, and the device will reboot. Rebooting will take approximately 5 seconds. Do not turn off the power until the reboot is completed and the green LED is flashing to indicate normal operation.

Default Values

- Pedestrian Tag Danger: 4 m
- Pedestrian Tag Caution: 8 m
- Vehicle Tag Danger: 8 m
- Vehicle Tag Caution: 10 m

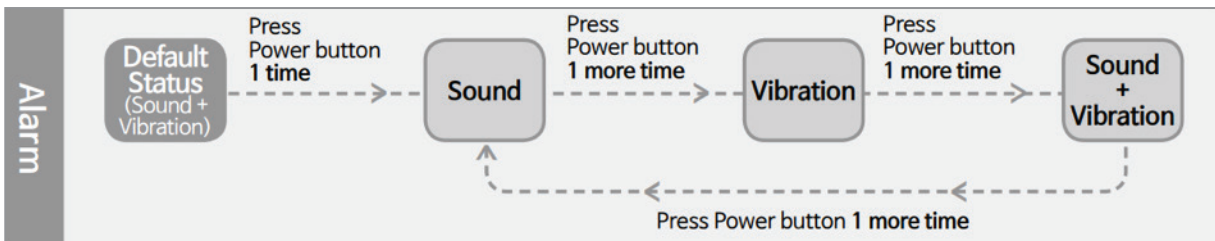


Pedestrian Tag Setting Adjustment

Note that the Pedestrian Tag (PT) setting adjustments can only be accessed while the device is in normal operation (not in an alarm state).

Alarm Type Setting

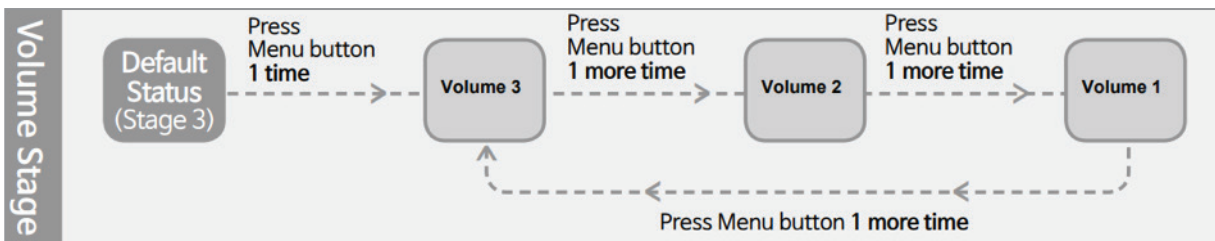
1. Press and hold the MENU button for 2 seconds. A short vibration will occur to indicate you have entered setting adjustment mode.
2. Press the POWER button to set the desired alarm type by cycling through the options (Sound, Vibration, or Sound + Vibration).
3. Press and hold the MENU button for 2 seconds. A short vibration will occur to indicate you have exited setting adjustment mode.



Note that if no buttons are pressed for 5 seconds while in setting adjustment mode, the Pedestrian Tag will return to normal mode automatically.

Volume Setting

1. Press and hold the MENU button for 2 seconds. A short vibration will occur to indicate you have entered setting adjustment mode.
2. Press the MENU button to set the desired volume by cycling through the options (Quiet, Medium, Loud).
3. Press and hold the MENU button for 2 seconds. A short vibration will occur to indicate you have exited setting adjustment mode.



Note that if no buttons are pressed for 5 seconds while in setting adjustment mode, the Pedestrian Tag will return to normal mode automatically.

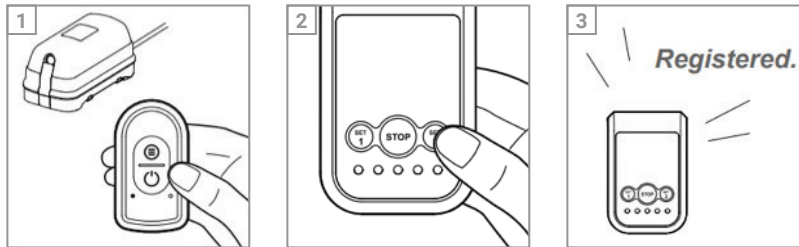


Driver Mode

Driver mode is a function that allows a Vehicle Tag + Indicator to ignore the presence of a specific Pedestrian tag. This allows someone, for example the vehicle driver, to remain within the caution or danger distance of the vehicle without constant warnings from the SPDS system. Only one Pedestrian Tag can be registered with a Vehicle Indicator at a time. The first tag must be released before a second tag can be registered. Driver mode is disabled by default and must be activated by Laserglow on customer request.

How to Register a Driver Pedestrian Tag

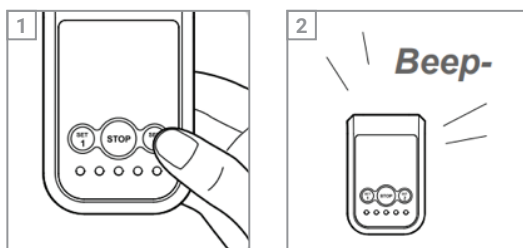
1. Place the Pedestrian Tag within 1 meter of the Vehicle Tag.
2. Press and hold the SET 2 button on the Vehicle Indicator for 2 seconds.
3. The Vehicle Indicator will confirm the successful registration with the voice message "Registered." The Vehicle Indicator will beep once if an error occurred.



How to Release a Driver Pedestrian Tag

A driver tag is automatically released when the system is powered off. To release a driver tag manually:

1. Press and hold the SET 2 button on the Vehicle Indicator for 2 seconds.
2. The Vehicle Indicator will confirm the tag is released with a beep.





How to Use

Vehicle Tag and Vehicle Indicator Operator Information

Situation	LED Status	Alarm	Mute Alarm
Pedestrian or Vehicle enters Caution Area	Continuous flashing red/green	Continuous repeating "Watch Out"	Press STOP button once. Alarm will occur again when muted pedestrian/vehicle leaves area and returns, or new pedestrian/vehicle enters area
Pedestrian or Vehicle enters Danger Area		Continuous repeating "Danger"	

Pedestrian Tag Operator Information

Situation	LED Status	Alarm	Pause Alarm	Mute Alarm
User enters vehicle Caution Area	Intermittent flashing green	Beeping, short interval vibrations, or both (depending on settings)	Press MENU or POWER button once	Press MENU or POWER button twice (PT will beep to confirm)
User enters vehicle Danger Area		Siren, long interval vibrations, or both (depending on settings)	Alarm will resume after 10 seconds	Alarm will occur again when muted pedestrian/vehicle leaves area and returns, or new pedestrian/vehicle enters area
Pedestrian TagPT Battery Low (less than 4 hours remaining)	Intermittent flashing red	5 rapid beeps every 10 minutes	-	-

Refer to "Pedestrian Tag Setting Adjustment" for changing alarm type.

Note: Vehicles and Pedestrians leaving the Caution or Danger area need to move 1 meter further away than the detection radius for the alarm to stop.



Troubleshooting

Problem	Reason	Solution
Access to Pedestrian Tag Menu is unavailable	Pedestrian Tag is not turned on	Press and hold the power button for 2 seconds to turn on the Pedestrian Tag.
	Pedestrian Tag button lock is enabled	Contact Laserglow or your authorized distributor to enable or disable the Pedestrian Tag button lock.
Red LED on Pedestrian Tag	Pedestrian Tag battery is low	Charge the Pedestrian Tag with a micro-USB cable. The LED will illuminate green when fully charged.
Volume of the Vehicle Indicator warning is too low	Vehicle Indicator volume setting is low	Change the volume of the Vehicle Indicator with the SET 1 and SET 2 buttons (only works when alarm is inactive)
Pedestrian Tags and Vehicle Indicators do not sound the alarm precisely at the set distances.	Horizontal detection range does not account for vertical height differences. A VT mounted on the roof of a 3m tall vehicle with a 2m alert distance will not detect a PT on the floor beside the vehicle.	Take vertical distance into account when setting Vehicle Indicator detection distances.
	Vehicles and pedestrians entering the detection distance must move an additional 1 meter beyond the set distance for the alarm to cease	This is normal operation and cannot be adjusted.
	The SPDS measures the distance between tags every 0.5 seconds. Fast moving vehicles may move deep into the detection area before the alert will sound due to this 0.5 second delay.	Take vehicle speed into account when setting Vehicle Indicator distances by adding the distance a vehicle can travel in 0.5 seconds to the desired detection range.

Frequently Asked Questions

Q: Can I mute the alarm on my Pedestrian Tag and Vehicle Indicator when I need to drive the vehicle?

A: Yes. See the "How to Use" section of this manual for information on muting alarms.

Q: Can I pause the alarm temporarily while I talk to the driver of a vehicle for a moment?

A: Yes. See the "How to Use" section of this manual for information on pausing alarms.



Regulatory Information

Model No: SPDPT [Pedestrian Tag], SPDVT [Vehicle Tag]

FCC ID: 2AWBN-SPDPT , 2AWBN-SPDVT

IC ID: 26108-SPDPT , 26108-SPDVT

Manufacturer: Laserglow Technologies / CANADA

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution: Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The following statement applies to all products that bear the FCC logo on the product label. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. See 47 CFR Sec. 15.105(b). These limits are designed to provide reasonable protection against harmful interference in a residential installation. This 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 radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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