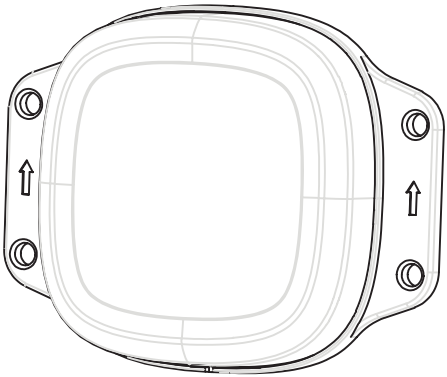

PBS-RD1

77GHz Blind Spot Detection Assist System

OPERATION GUIDE / MANUAL

ECHOMASTER PRO

Thank you for purchasing the EchoMaster PBS-RD1

The EchoMaster Pro radar detection system is designed to assist in the avoidance of obstacles while reversing and driving.

Disclaimer:

EchoMaster® is strictly a driver assistance device, and should not be relied upon as a substitute for safe driving practices. Use common sense when parking and always follow recommended safe driving guidelines from your local, State and County Department of Motor Vehicles regarding parking procedures. To help prevent accidents, always use caution when parking, looking visually to ensure your path is clear. Keep speeds under three miles per hour. The owner shall not be entitled to recover from the Company, its successors or assignees, incidental and consequential damages, such as personal injury, loss of income, loss of time, loss of profits, loss of vehicle use or property damage.

No employee, agent or representative of the Company of the Selling Retailer may modify, alter or extend this Warranty in any way. This Warranty gives you specific legal rights. You may also have other rights under this Warranty which may vary from state to state.

Note: Under no circumstances should you attempt to open the control box or any other component. Doing so will void all manufacturer's warranties.

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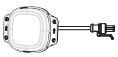
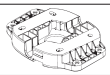
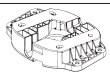
SYSTEM COMPONENTS

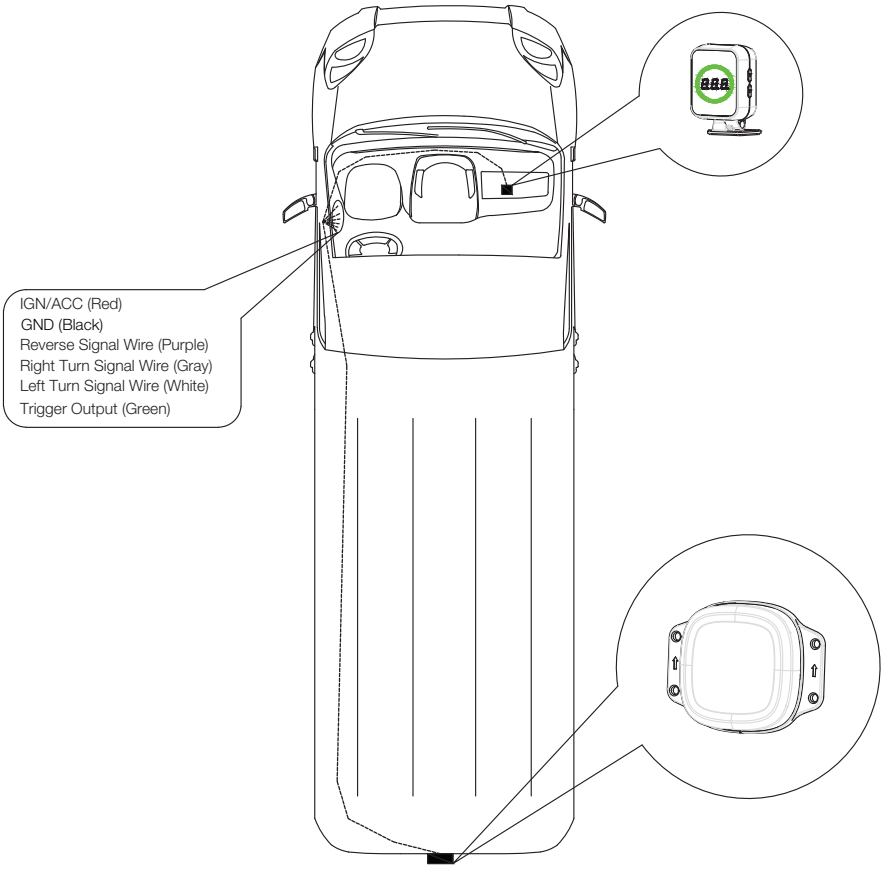
No.	Name	Diagram	Qty
1	Sensor		1
2	Display		1
3	Main Harness		1
4	32.8' (10m) Sensor Extension		1
5	16.4' (5m) Sensor Extension		1
6	5° Angled Sensor Mounting Plate		1
7	10° Angled Sensor Mounting Plate		1
8	Sensor Bracket		1
9	Screw 4.8*30mm		4
10	Screw 5*20mm		8
11	Screw 4*15mm		2
12	Cable Tie		10
13	QR Card		1

ECHOMASTER PRO

Blind Spot Detection Assist System

INSTALLATION GUIDE

SYSTEM WIRING DIAGRAM



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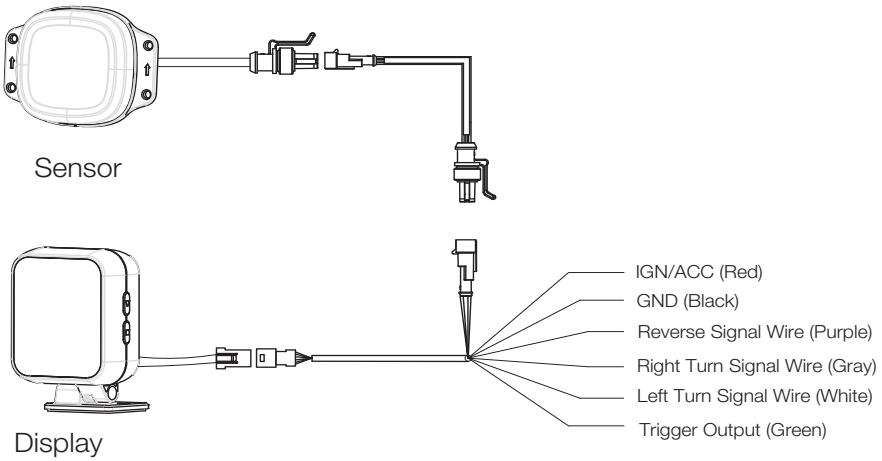
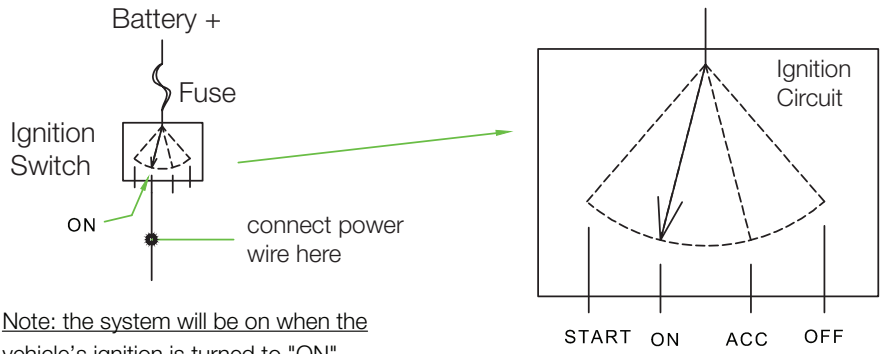
SYSTEM CONNECTION OVERVIEW



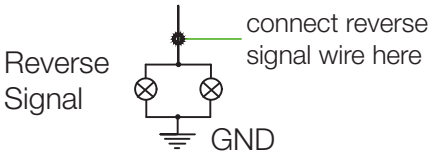
1: Connect Ignition Power Wire (+)



Note: the system will be on when the vehicle's ignition is turned to "ON".

ECHOMASTER PRO

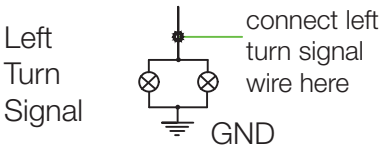
2: Connect Reverse Signal Wire (+)



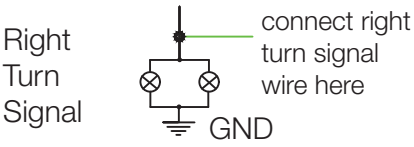
3: Connect Ground (-)

Connect the ground ring terminal (black wire) to chassis ground.

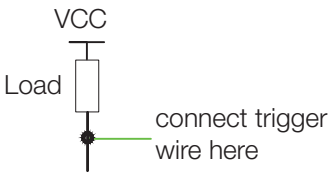
4: Connect Left Turn Signal Wire (+)



5: Connect Right Turn Signal Wire (+)



6: Connect Trigger Output Wire (-)
Note: Optional Connection



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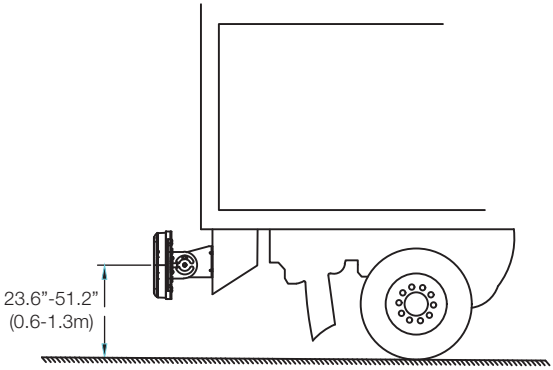
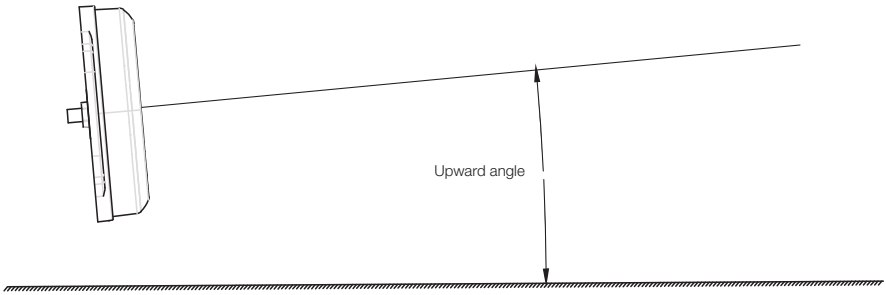
SENSOR INSTALLATION

1: Installation Height Requirement



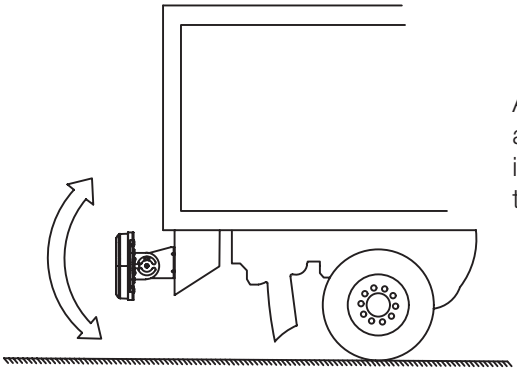
2: Vertical Angle Requirement



Installation height	Upward tilt angle
23.6”-29.5” (0.6-0.75m)	10°
29.5”-51.2” (0.75-1.3m)	5°

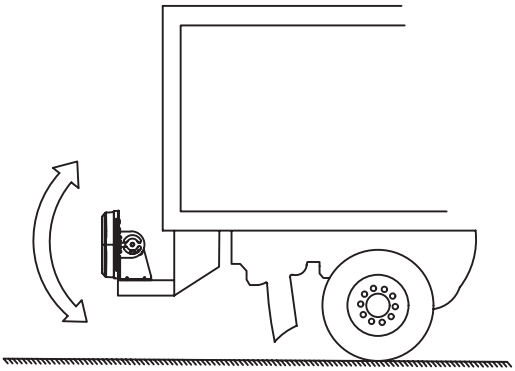
Illustrations are typical and may not match exact vehicle detail

3: Sensor and Bracket Orientation



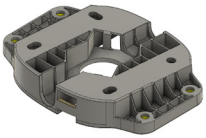
A. The sensor bracket is fixed on a horizontal plane and the vertical installation angle is adjusted through the installation bracket.

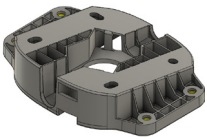
B. The sensor bracket is fixed on a vertical plane and the vertical angle is adjusted through the installation bracket.



4. Sensor Mounting Without Bracket

For flush mounting applications where the sensor will be mounted directly to the vehicle body. Use the included 5° or 10° angled mounting plate based on installation height of the sensor.





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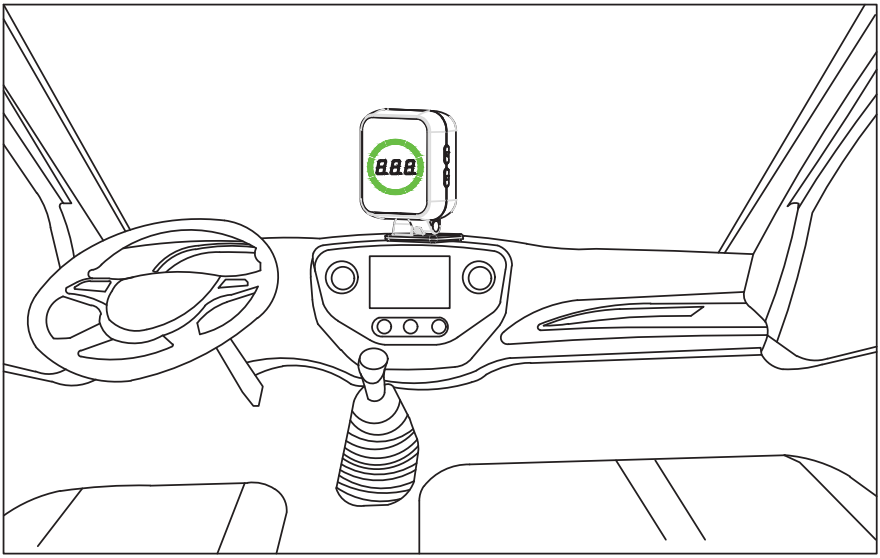
DISPLAY INSTALLATION



1: Select Location

Choose a suitable mounting location that the driver can easily observe the content on the display.

2: Display Mounting

Clean the mounting location with an alcohol swab or similar. Remove the 3M adhesive backing and adhere the display mount to the dash or other chosen location. Alternatively, screws can be used to mount the display in place.

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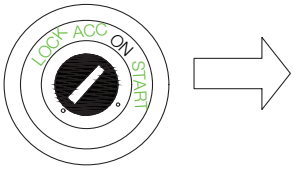
FUNCTION DESCRIPTION

1: Self Diagnosis

When the key is turned to the “ON” position, the system starts a self-diagnostic procedure and informs the driver of the system status by audible and visible alerts.



System Status	Display Reading	Sound Cue
Normal Operation		Beep once （Bi--）
Sensor Abnormality		Beep twice （Bi-Bi-）

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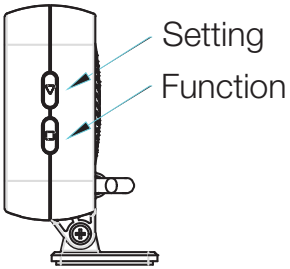
2: System Settings

Press the “Function” button to select the function and press the “Setting” button to enter the settings for that function.



Function Selection - Button Count	Setting Functions	Display Reading	Define	Notes
1 Time	Volume Setting	0	No Sound	Press □ button once, the buzzer will beep once to enter volume adjustment mode. Press the ▽ setting button, the volume will cycle through 2, 1, and 0, and stop pressing to automatically save and exit. 
		1	Low Output	
		2	High Output	
2 Times	Standard Settings (Distance Reading)	F0	Metric System	Press the □ button twice, the buzzer will beep once to enter the display standard setting mode. Press the ▽ setting key, cycle through F0 and F1 modes, and stop pressing to automatically save and exit. 
		F1	Imperial System	
3 Times	Target Type Setup	C0	All targets detected	Press the □ button three times, and the buzzer will sound once to enter the target detection setting mode. Press the ▽ setting button, cycle through C0 and C1 modes, and stop pressing to automatically save and exit. 
		C1	Only detect moving targets	
4 Times	Sensor Learning Function Setup (Refer to page 13 for more detail)	L0	Not Learning	Press the □ button four times, the buzzer will beep once to enter the learning setting mode. Press the ▽ setting button once, and the display will display "L1". The system will enter the learning mode, and the green bars will light up one by one in a circle during the learning process. After successful learning, "L5" will be displayed and keep ringing for one second. 
		L1	Automatic Learning	

5 Times	Detection Range Setting	d3.0	Detection Range = 9.8'*7.9' (3.0m*2.4m)	Press the □ button five times, and the buzzer will sound once to enter the detection distance setting mode. Press the ▽ setting button once, and the mode will cycle through d3.0, d4.5, d5.0, d6.0, d10, and dFF. Stop pressing and automatically save and exit.
		d4.5	Detection Range = 14.8' * 11.2' (4.5m * 3.4m)	
		d5.0	Detection Range = 16.4' * 13.1' (5.0m * 4.0m)	
		d6.0	Detection Range = 19.7' * 14.4' (6.0m * 4.4m)	
		d10	Detection Range = 32.8' * 16.4' (10m * 5.0m)	
		dFF	Used for Manufacturer Programming Only	

Length 9.8' (3.0m) Width 7.9' (2.4m) — d3.0

Length 14.8' (4.5m) Width 11.2' (3.4m) — d4.5

Length 16.4' (5.0m) Width 13.1' (4.0m) — d5.0

Length 19.7' (6.0m) Width 14.4' (4.4m) — d6.0

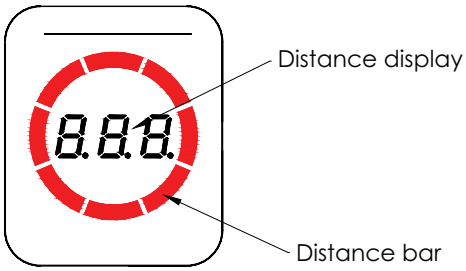
Length 32.8' (10.0m) Width 16.4' (5.0m) — d10

Used for Manufacturer Programming Only — dFF

3: Rear Parking Assist

When the key is turned to the "ON" position and the Reverse gear is engaged, the system is activated. If an obstacle is detected, its distance will be shown on the display, along with an audible tone and visual alert.

The alarm method is as follows:
Audible and Visual Warning Display will show the obstacle distance and provide warning beeps according to the distance of the obstacle. The alarm section will be divided into 5 equal segments according to the farthest detection distance.



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Detection Zone	Obstacle Distance	Distance Display	Color Bar Display	Audible Alarm
1	Not detected	— —	Light bar is off	No Tone
2	26.6' - 32.8' (8.1 - 10.0m)	26.6 - 32.8 (8.1 - 10.0)	Bright green color stripes 	1Hz-8Hz Stepless Gradient
3	20.0' - 26.2' (6.1 - 8.0m)	20.0 - 26.2 (6.1 - 8.0)	Bright yellow green stripes 	
4	13.4' - 19.7' (4.1 - 6.0m)	13.4 - 19.7 (4.1 - 6.0)	Bright yellow stripes 	
5	6.9' - 13.1' (2.1 - 4.0m)	6.9 - 13.1 (2.1 - 4.0)	Bright orange stripes 	
6	4.1' - 6.6' (1.26 - 2.0m)	4.1 - 6.6 (1.26 - 2.0)	Bright red stripes 	
7	≤ 4.1' (≤1.25m)	-P-		Solid Tone

Note:

A. The color bars are segmented into 5 equal parts according to the longest distance.

B. The "- P -" area is 1/8 of the farthest detection distance; When displaying "- P -", the speaker will output a solid tone.

C. The frequency of other alarm areas increases from 1Hz to 8Hz as the obstacle approaches.

4: Learning Function

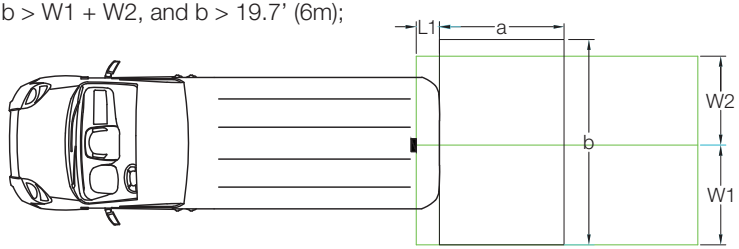
When the installation position of the radar is not at the outermost side of the vehicle, the radar can easily detect the vehicle body, or vehicle accessories in the rear bumper area, which can result in a false alarm. Therefore, it is necessary to enter the learning mode to teach the radar to ignore the obstacle causing false alerts.

Use the following steps to go through the learning function.

A. Move the vehicle to an open area and confirm that there are no obstacles other than body accessories within (a*b) distances of the radar.

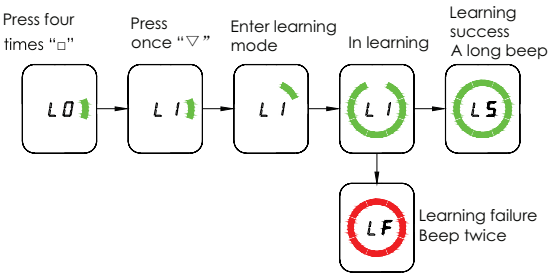
a > 4*L1, and a > 9.84' (3m);

b > W1 + W2, and b > 19.7' (6m);



B. Power on and wait for the system's self diagnosis to complete.

C. Press the "□" button four times, the buzzer will beep once to select the learning mode setting. Short press the "▽" button one time so the display shows "L1." The system will now enter learning mode. The green bars will light up one by one during the learning process and the results will be displayed after the process is completed. If "L5" is displayed and one beep is heard, then the learning process was successful. If "LF" is displayed and two beeps are heard, then the learning process has failed. Retry the learning mode if the process fails the first time.



Illustrations are typical and may not match exact vehicle detail

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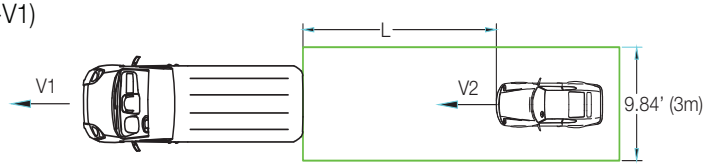
5: Rear Collision Warning (RCW)

The system is active when the key is turned to the “ON” position and any gear, except reverse is engaged. If any one of the following two conditions is met, and the hazard warning light is off, the RCW alarm will be triggered (controlling the flashing of the hazard warning light through the trigger wire). After the alert is finished, the hazard warning light will turn off.

a. L < 0.3s*V2;
b. TTC < 1.5s;
Note: TTC = L / (V2-V1)

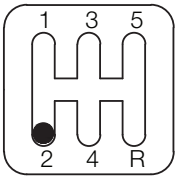


Illustrations are typical and may not match exact vehicle detail

6: Blind Spot Detection BSD/Lane Change Aid (LCA)

A. Conditions

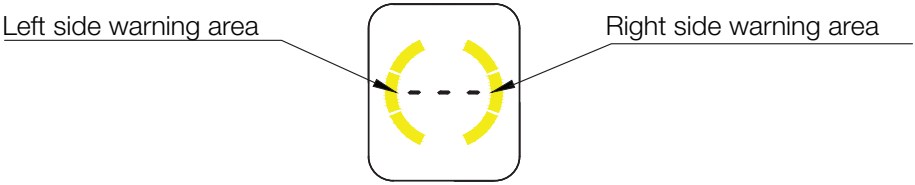
Any gear but R



B. Basic Functions

The left and right sides of the display have the same function and are independent of each other.

The display warning area is as shown below:



Taking the right side of the display as an example, the function is as follows:
There is no car in the alarm area and the display does not show obstacles.

Illustrations are typical and may not match exact vehicle detail

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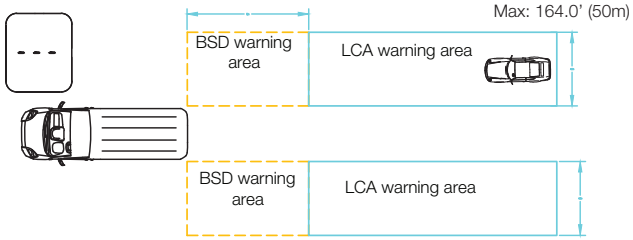
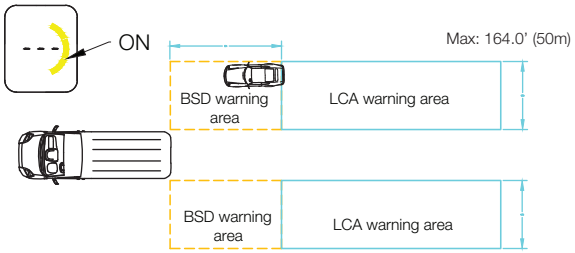
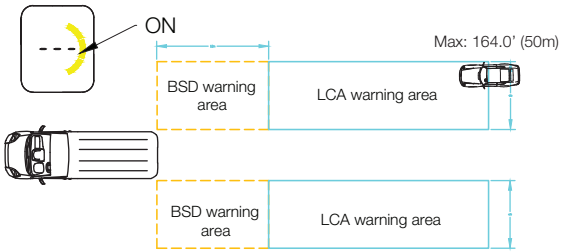
There is no vehicle in the BSD alarm area and there is a vehicle in the LCA alarm area, but the overtaking time is greater than 3.5 seconds, the display will not alert the driver.



If a vehicle is in the BSD warning area, a first-level alarm will be issued (the color bar on the right side of the display will be ON)

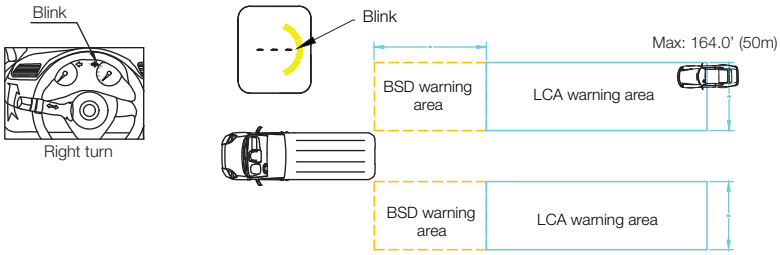


If a vehicle is in the LCA warning area and the overtaking time is less than 3.5 seconds, a first-level alarm will be issued (the color bar on the right side of the display will be ON)



Illustrations are typical and may not match exact vehicle detail

In the case of the first-level alarm, when turning right, the second-level alarm will be issued (the color bar on the right side of the display will blink and the buzzer will beep twice).



Illustrations are typical and may not match exact vehicle detail

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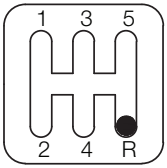
7: Rear Cross Traffic Alert (RCTA)

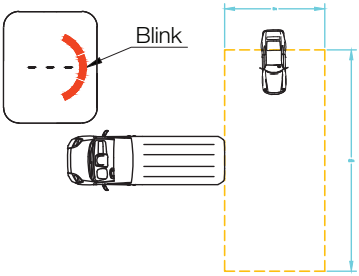
A. Conditions

In Reverse gear

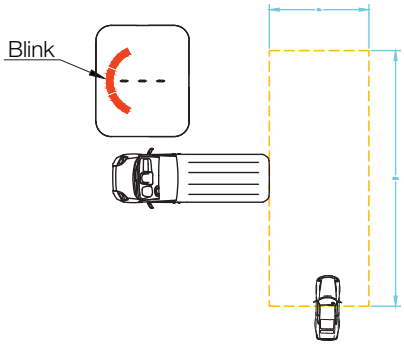


B. Warning Functions

When an obstacle on the right side enters the warning area, the color bar on the right side of the display blinks and beeps twice.



When an obstacle on the left side enters the warning area, the color bar on the left side of the display blinks and beeps twice.



Illustrations are typical and may not match exact vehicle detail

8: Automatic Brightness Adjustment

The display detects the external brightness and will automatically adjust the brightness of the display.

9: Detection Range Settings

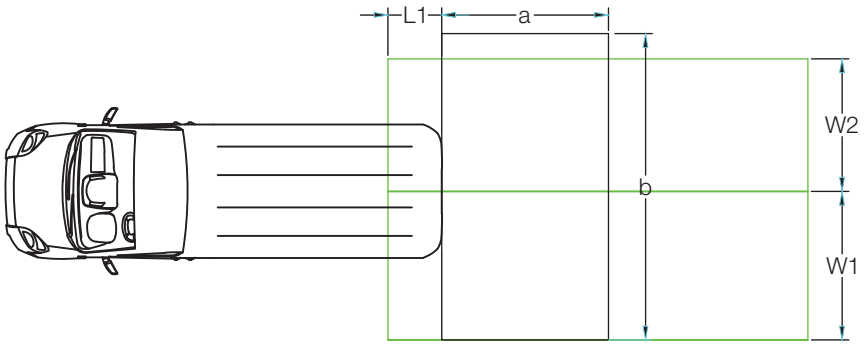
The detection range of the sensor is shown in the figure below. For different vehicle models and conditions, the detection area can be configured by the display setup buttons.

L1: Setup for the rear step, the distance from the sensor installation position to the rearmost part of the vehicle. The default value is 0” (0m).

L2: Warning distance (setting range: 3.28’-98.4’ (1-30m), accuracy: 3.94” (0.1m)), default: 32.8’ (10.0m)

W1: Detection width on the left side of the radar sensor (setting range: 3.28’-16.4’ (1m-5m), accuracy: 3.94” (0.1m)), default: 4.27’ (1.3m)

W2: Detection width of the right side of the radar sensor (setting range: 3.28’-16.4’ (1m-5m), accuracy: 3.94” (0.1m)), default: 4.27’ (1.3m)



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INSTALLATION NOTES

1: This product is designed to work with 12-24V battery vehicles.
2: The front of the radar sensor should not be covered by metal objects.
3: Connect cables according to the labels.
4: Make sure the wiring harness is secured and far away from heat sources, sharp edges and any moving vehicle components. Avoid pulling on the harnesses.
5: Wrap all wire to wire connections with electrical tape, or cover with heat shrink.
6: If there is ice or dirt on the surface of the sensor, please clean it off for the best operation. Paint will also affect the detection ability.
7: Obstacles such as soft sponges, spheres, and sharp pointed objects can not be detected easily.

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TECHNICAL PARAMETERS

Operating Voltage	DC 9-16V
Current Consumption	＜350mA@12V
Working Temperature	-40˚ F-176˚ F
Storage Temperature	-40˚ F-176˚ F
Frequency	77-81GHz
Modulation Mode	FMCW
Antenna Type	2TX,4RX
Vertical Angle	30°
Horizontal Angle	150°

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