

USER's GUIDE MANUAL

(Radar Object Detection Sensor)

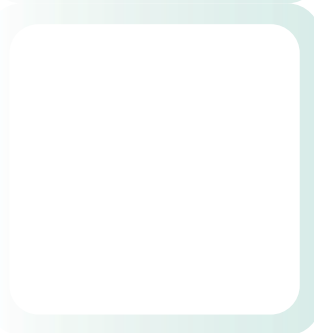
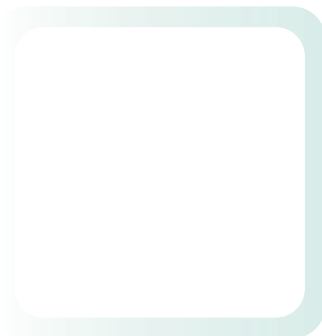
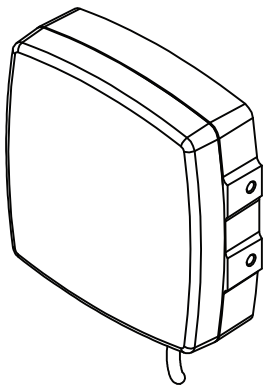


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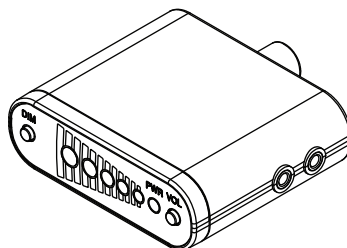
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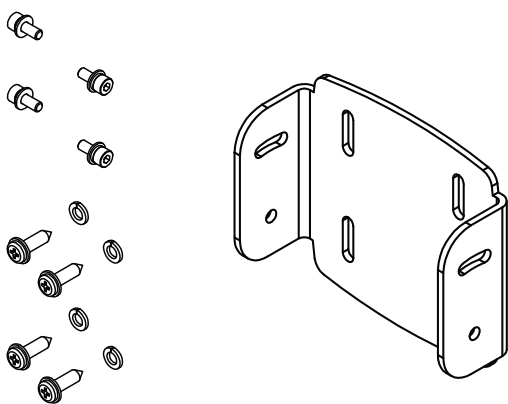
- RADAR Sensor



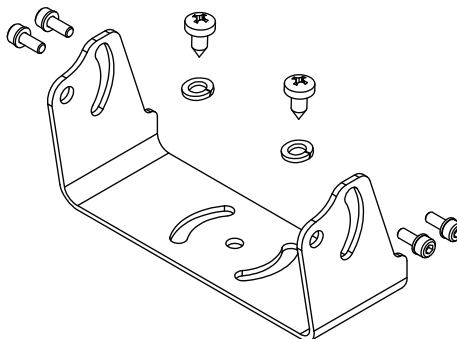
- Display unit



- Wall Mount Included screw pack



- Bracket for Display unit Included screw pack



- Extension Cable
→ 9M (29ft) or 20M (65ft)



- User's Guide





System Description

- The Radar Object Detection System uses FMCW (frequency modulated continuous wave) radar technology to detect stationary objects and people in blind spots.
- This advanced system alerts the operator with both visual and audible warnings.
- The system has three distinct length and width modes, enabling the operator to adjust the system to fit their needs.
- The system's capability of being able to determine whether an object is approaching or moving away from the sensor, helps to limit the number of false detections caused by objects of no concern encroaching on the detection area.
- The commercial grade heavy-duty system has an IP69K waterproof rating and works perfectly in all weather conditions.



Object Detection Capability

The radar sensor transmits and receive 24 GHz radar signal.

It then process the returned signals to determine if an object has reflected any energy back to the sensor .

Our test condition is Radar sensor (height 1 meter location) with adult person at open side.

1dBsm (dB square meter), "Person reflection" approx.at 1dBsm, "Car reflection" at 10dBsm.

The detection range test should be proceeded at outdoor. The detection zone has been cleared of all obstacles.

Any obstacles in the detection zone will interfere with the test.

All dimensions for detection of objects are nominal and very significantly depending on many parameters.

In the case where there are multiple objects in the detection area at various distance and/or angles, the sensor detects the closest object, which is the most important one for collision avoidance.

Factors Influencing the Detection of Objects

The object properties, location and direction are vey key influences in deterring if an object is detected or not.

Size: A large object usually reflects more energy than a smaller object.

Composition: Metal is detected better than non-metal materials

Shape: A flat object is better detected than a complex shape. Variation in relative location and direction can influence detection.

Angle: An object facing directly towards the sensor is detected better than an object that is located towards the edges of the detection area or at an angle.

Ground condition: Objects on flat, mineral material ground are better detected than on rough or metal surfaces.

Installation

Sensor Mounting

The installation site should be flat. Ideally the radar sensor should be mounted on the rear of the vehicles as close to the center as possible at roughly 1 meter above the ground. The sensor should be mounted in the upright position with cable exit on the sensor pointing downwards.

Mounting angle

Select the appropriate location to mount the sensor.

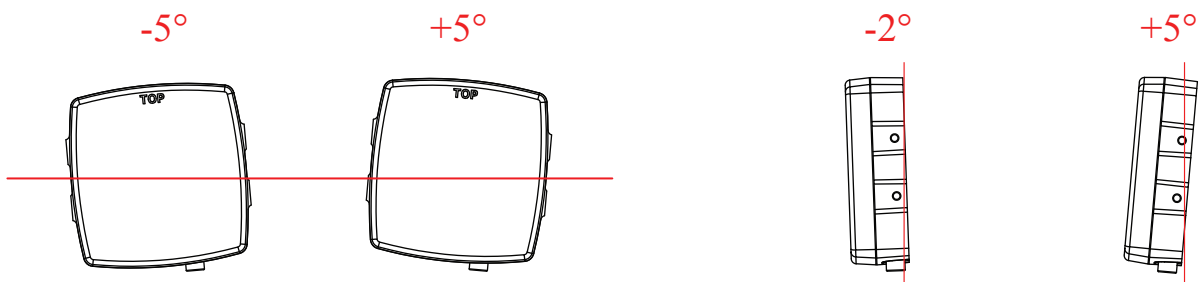
- Height tolerance (from ground); 1m +/- 0.3 m
- Vertical angle tolerance +5 (up), -2° (down)
- Horizontal angle tolerance +/- 5

Note:

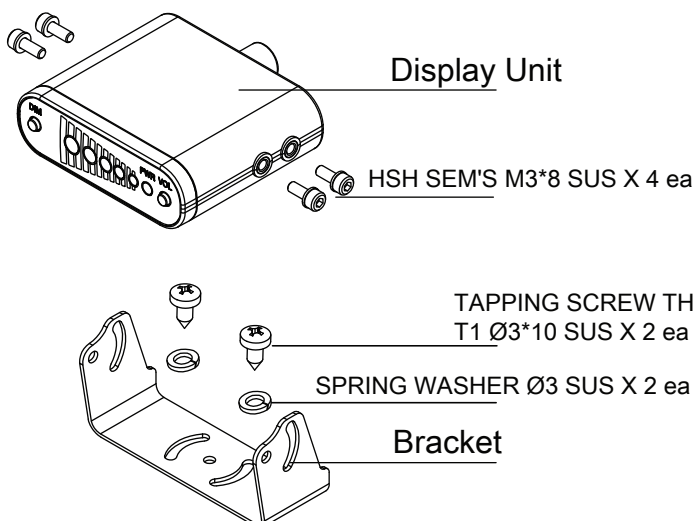
Before permanently installing the RODS(Radar object detection sensor) on the vehicle, verify that the selected sensor mounting location provides a clear detection zone.

Take the machine to a clear area, temporarily attach the sensor in the proposed mounting location, apply power to the system, and verify that nothing is being detected.

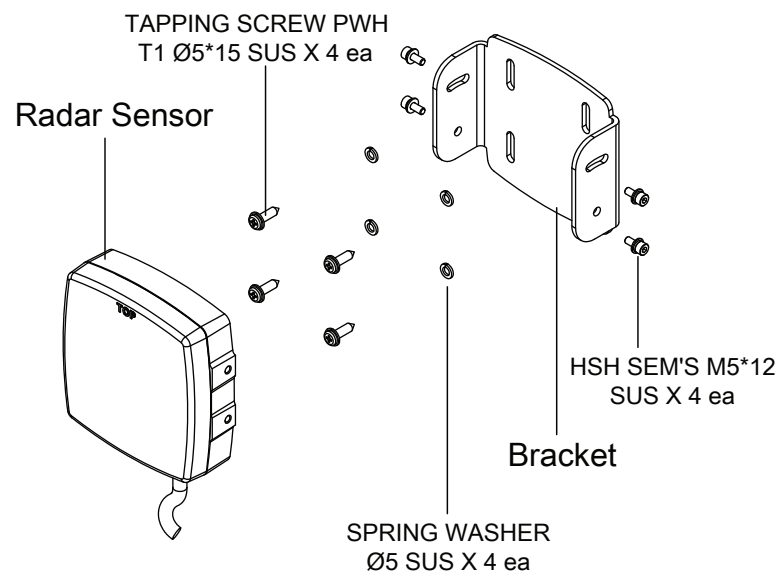
Our system is not affected if multiple systems are operating in the same area or on the same vehicle, even if they are installed in close proximity with overlapping detection ranges.



Display Unit install



Radar Sensor install

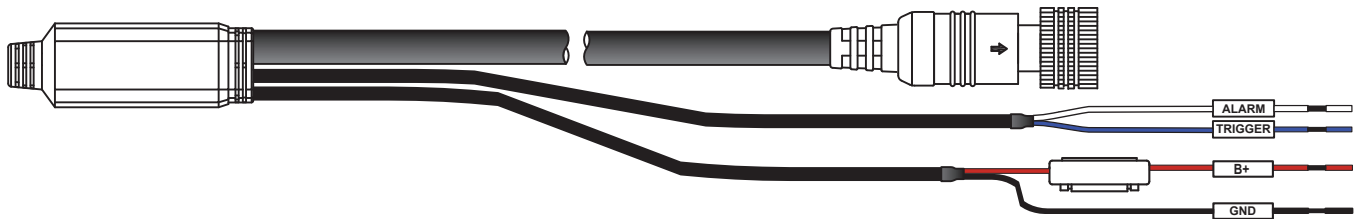


VI Radar Sensor

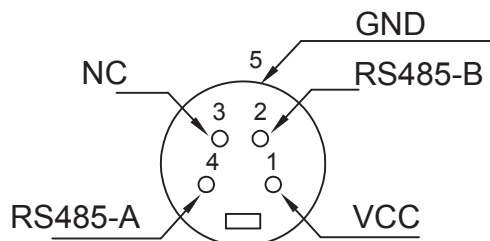
Radar Object Detection Sensor



• Rear Cable



• Connector Pin out



• Cable connection

Red : + Vehicle power supply or Reverse Power (3A fuse: Range +9~24V)

Black : Ground (Supply negative)

Blue : Activation input (Trigger from vehicle, High active) changes the system status between standby and active.

White : Alarm Out (Normal close → Alarm activation open)

Alarm output - The radar sensor provides an auxiliary output that becomes active whenever it detects an object. Controls when other equipment. e.g an external alarm or light is activated. Contact an agent for more information.

| Alarm out | Vehicle type |
|--------------------|--------------|
| 9 V & 0.9AMP (max) | 24V |
| 9 V & 0.5AMP (max) | 12V |

- Radar Sensor Technical Specification

| PARAMETER | Value | Units | Condition |
|-----------------------|---|--------|---------------|
| Transmit frequency | 24.06 ~ 24.22 | GHz | FCC, CE |
| Modulation | FMCW (Frequency Modulated Continuous Wave) | | |
| Supply voltage | 12 ~ 32 | V dc | |
| Current | 300 | mA@12V | W/O Alarm Out |
| Power on time | 300 | ms | |
| Detection time | 200 | ms | |
| Communication | RS-485 | | |
| Operating temperature | -40 ~ 85 | °C | |
| IP protection rate | 69K | | |
| Vibration | 15 | G | |
| Housing material | Polycarbonate | | |
| Dimension | 110(H) x 108(L) x 34(D) | mm | |
| Weight | 390 | g | W/O Bracket |
| | 720 | g | with bracket |

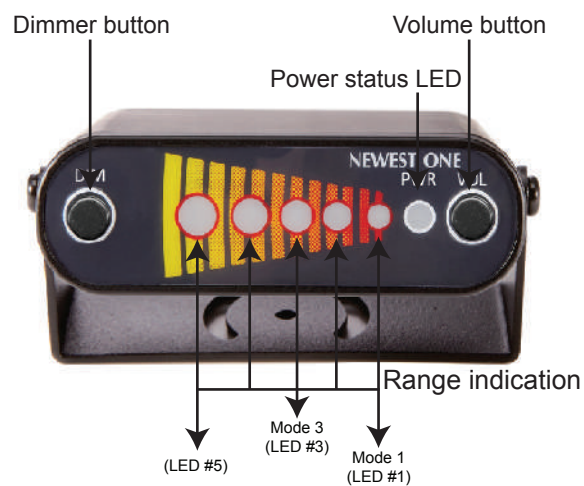
FCC WARNING

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

VII Display units

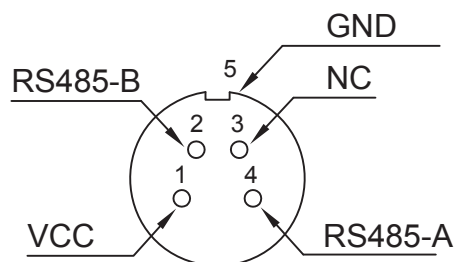
Display units



• Rear Cable



• Connector Pin out



Volume button : Press volume button to adjust volume level low, middle, and high
Led # 1 (Low level 78dB), LED#2 (Middle level 85dB), and LED#3 (High level 104dB) at 0.3 meter distance.
Press volume button for 3 seconds to switch silence.

Power Status LED : Illuminates green continuously after power is applied to the system

Range Indications : Illuminates to give operator a distance zone to the closest detected object.
LED's operate from the left to right,
with a closer object resulting in more LED's illuminated.

Dim Button : Press Dim button to adjust LED (2 steps)
(1) Press Dim button to verify the current mode for 3 seconds.
(LED 1 is less bright and LED 2 is the most bright)

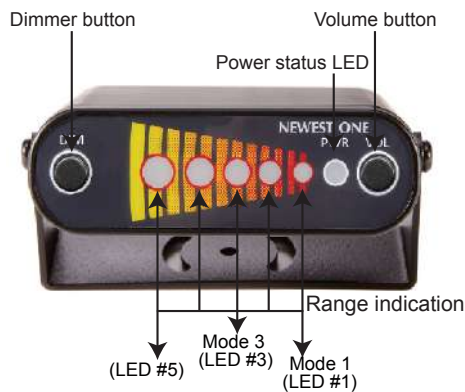
Factory Reset : Press Volume button before turn on system.
You can find that LED 1 ~ 3 are flashing sequentially.

- Display units Technical Specification

| | |
|-------------------------|---|
| Detection Zone | 5 Zones |
| Speaker | 3 x different volume level to be selected |
| Operating Temp. | -30°C ~ +70°C |
| Cable Length | 0.7 Meter |
| Connector | 4P Screw Lock type |
| Housing Material | Polycarbonate |
| Dimension | 20(H) x 65(L) x 54(D) mm |
| Weight | 220g with Bracket |



Changing Detection Mode



- ◆ LED # 5 is flashing (Furthest Detection zone 5)
- ◆ LED # 5, & 4 are flashing (Detection zone 4)
- ◆ LED # 5,4,& 3 are flashing (Detection zone 3)
- ◆ LED # 5 ~ 2 are flashing (Detection zone 2)
- ◆ All LEDs are flashing (Closest Detection zone 1)

Mode Adjustment.

- 1) Press both “Dim” and “Vol” to enter hidden menu simultaneously for 3 seconds.
(You can find all LED are flashing at 3 times then power led is blinking.)
- 2) Press Dim button to select to Mode 1 ~ Mode 3. (Mode 1, Mode 2 and Mode 3 are available)
Mode 1 : 3.0 x 5.0 (L) meter (5 zones)
Mode 2 : 4.0 x 6.0 (L) meter (5 zones)
Mode 3 : 6.5 x 9.0 (L) meter (5 zones)
- 3) Press Vol button to save the required Mode. After 2 seconds, you can find “all led are flashing at 15 times then Power LED on”
(When fail to select the required mode, please press Vol button again)

Button Explanation

- 1) Dim Button : Press Dim button to adjust LED (2 steps) / Press Dim button to verify the current mode for 3 seconds.
(LED 1 is less bright and LED 2 is the most bright)
Dim button for long key (press it for over 3 seconds), you can verify the saved current mode 1 ~ 3.
- 2) Volume button : Press Volume button for 3 seconds to switch silence (3 Steps)
- 3) Factory Reset: Press Volume button before turn on system. You can find that LED 1 ~ 3 are flashing sequentially.



When led #1,#3 and #5 turn on, the system has malfunction. Please contact factory.
When led #2 and #5 turn on, communication has error.

Factory Default Mode

- Detection mode : Mode 1 (3.0 x 5.0 meter, 5 Detection zones)
- Audio : Max
- LED Bright : Max

Before testing the system, make sure the sensors have a clear field of view.

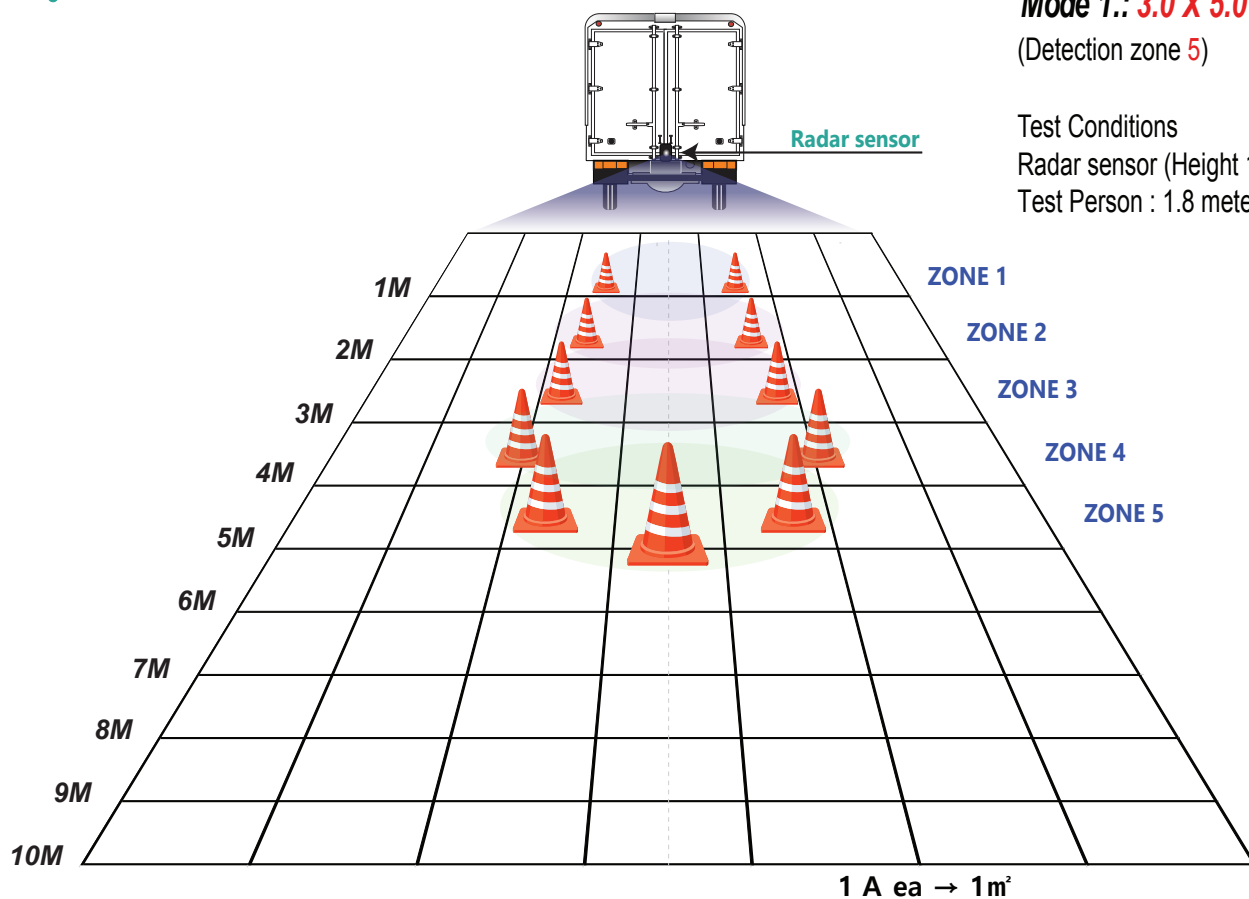
This is the most important when testing indoors because the system may detect walls, posts, etc.

Verify the green LED on the display is illuminated and the system indicates .

NO objects are detected. (Indicator LEDs are off).



Mode 1



Mode 1.: 3.0 X 5.0 meter

(Detection zone 5)

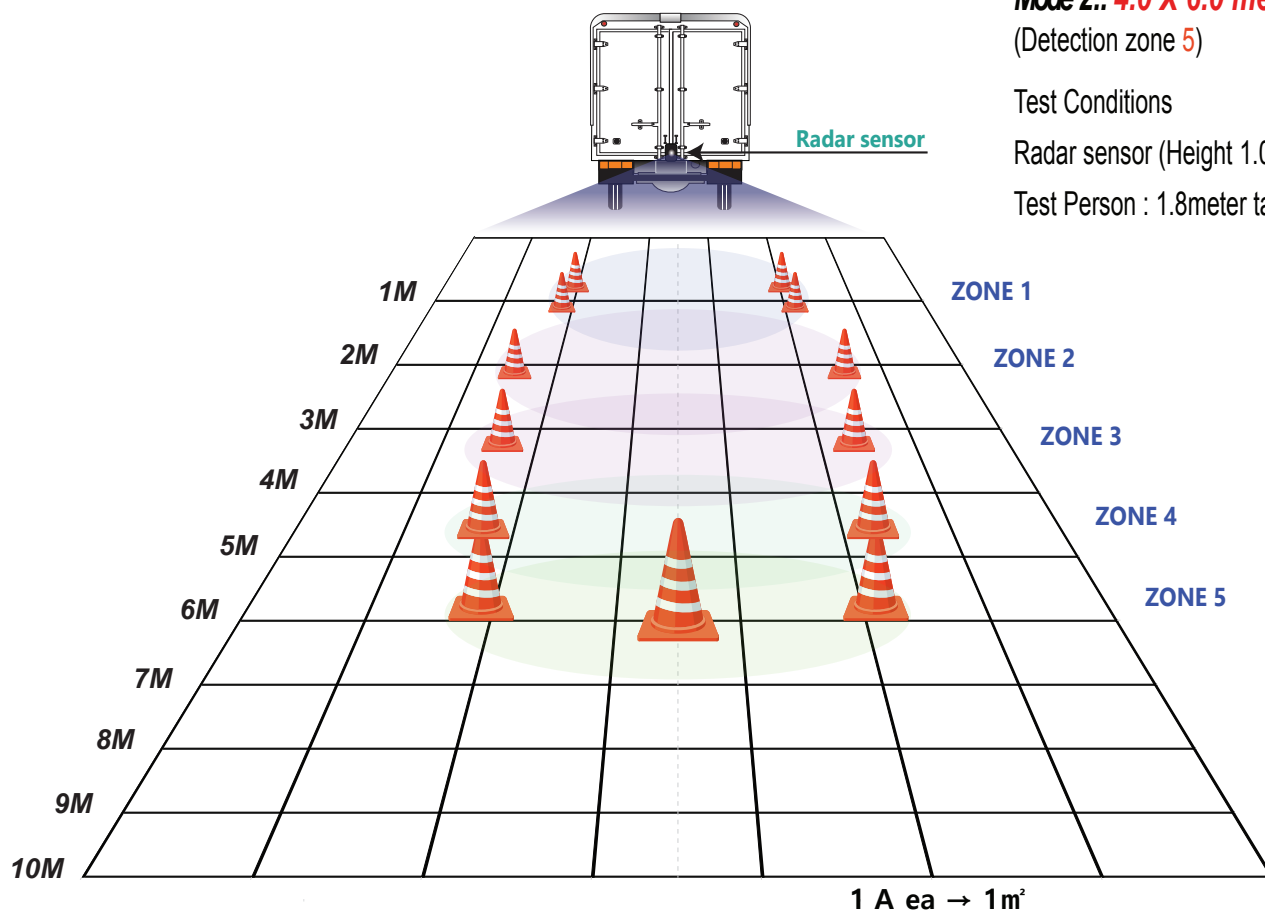
Test Conditions

Radar sensor (Height 1.0 meter)

Test Person : 1.8 meter tall



Mode 2



Mode 2.: 4.0 X 6.0 meter

(Detection zone 5)

Test Conditions

Radar sensor (Height 1.0 meter)

Test Person : 1.8meter tall.



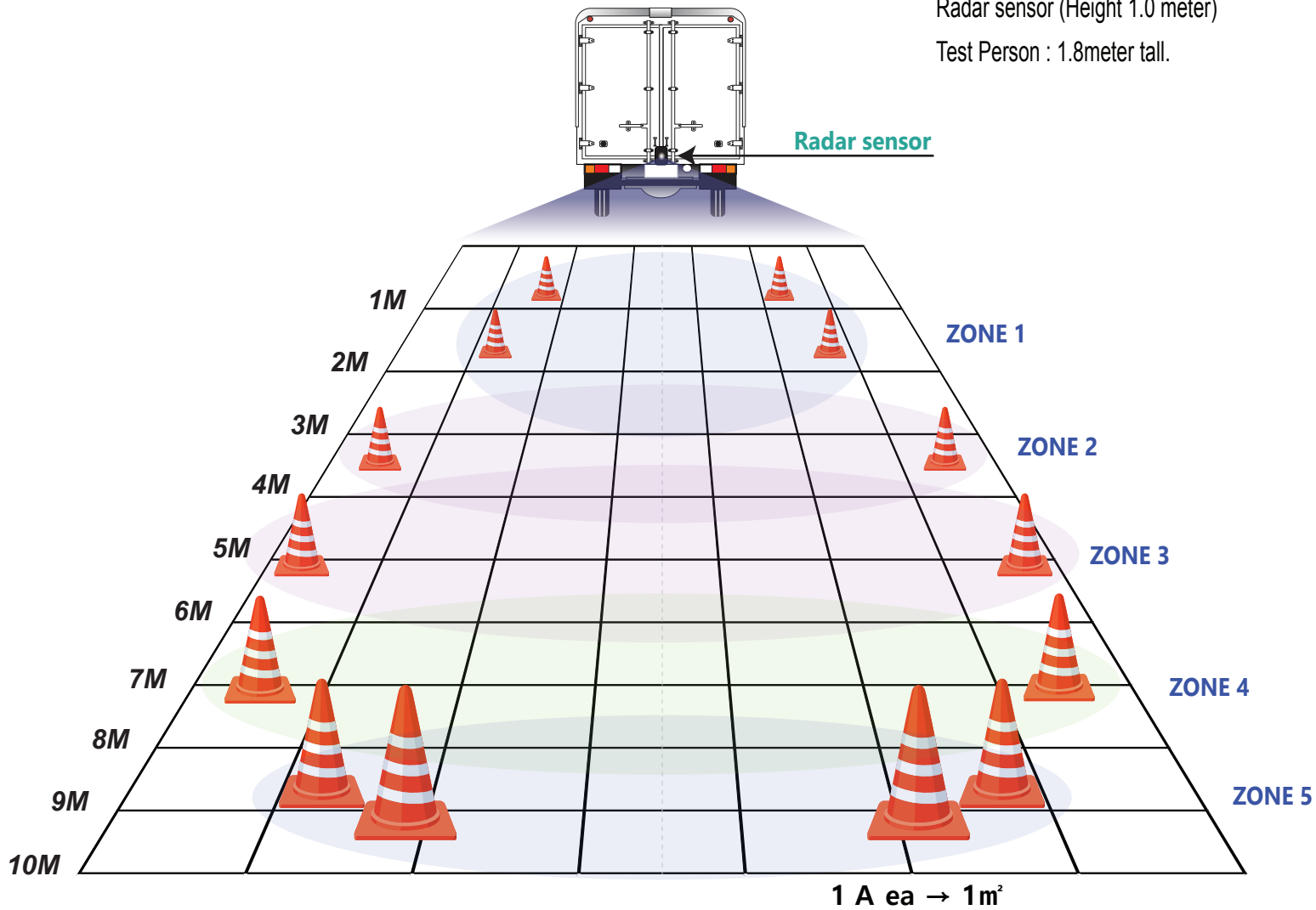
Mode 3

Mode 3.: 6.5 X 9.0 meter
(Detection zone 5)

Test Conditions

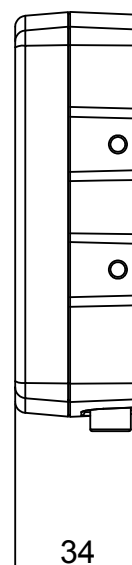
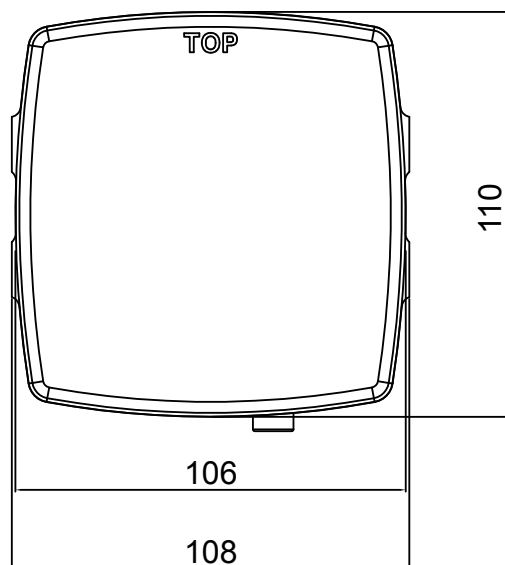
Radar sensor (Height 1.0 meter)

Test Person : 1.8meter tall.

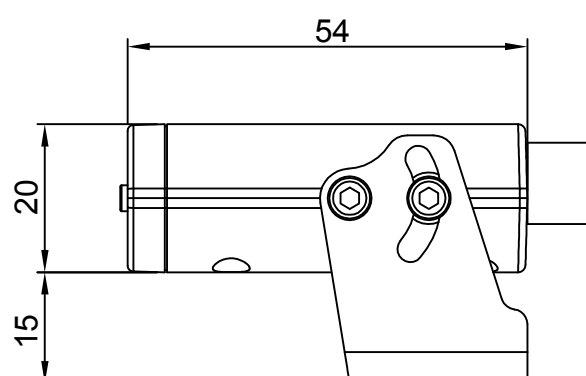
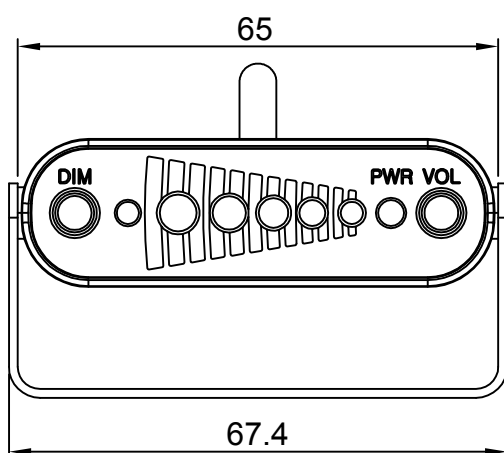


IX Dimension

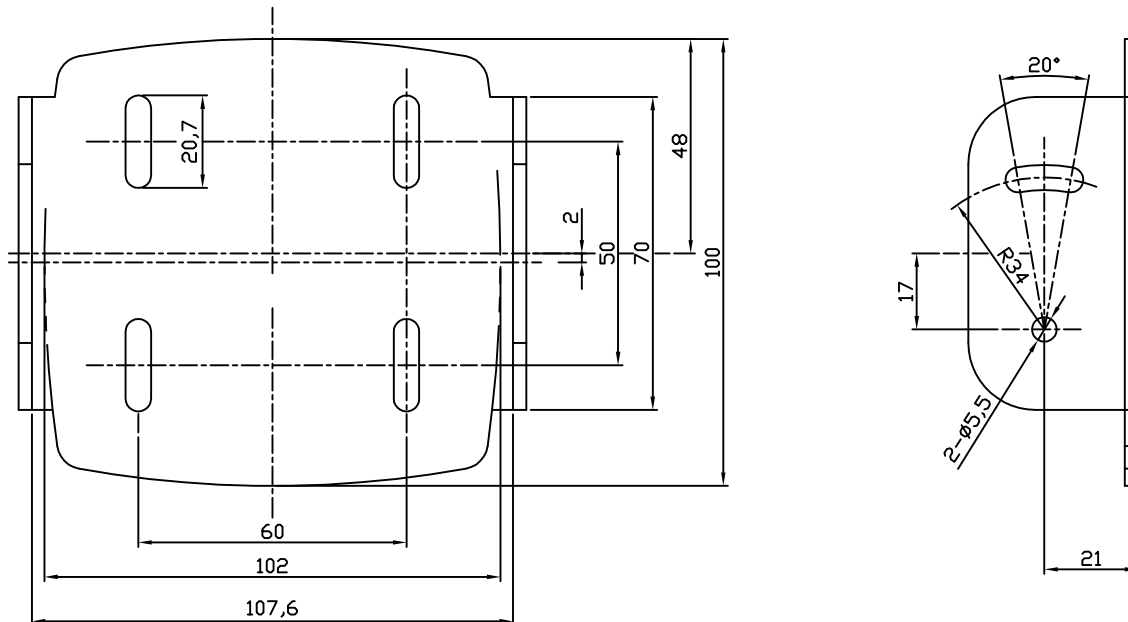
- Radar Sensor (mm)



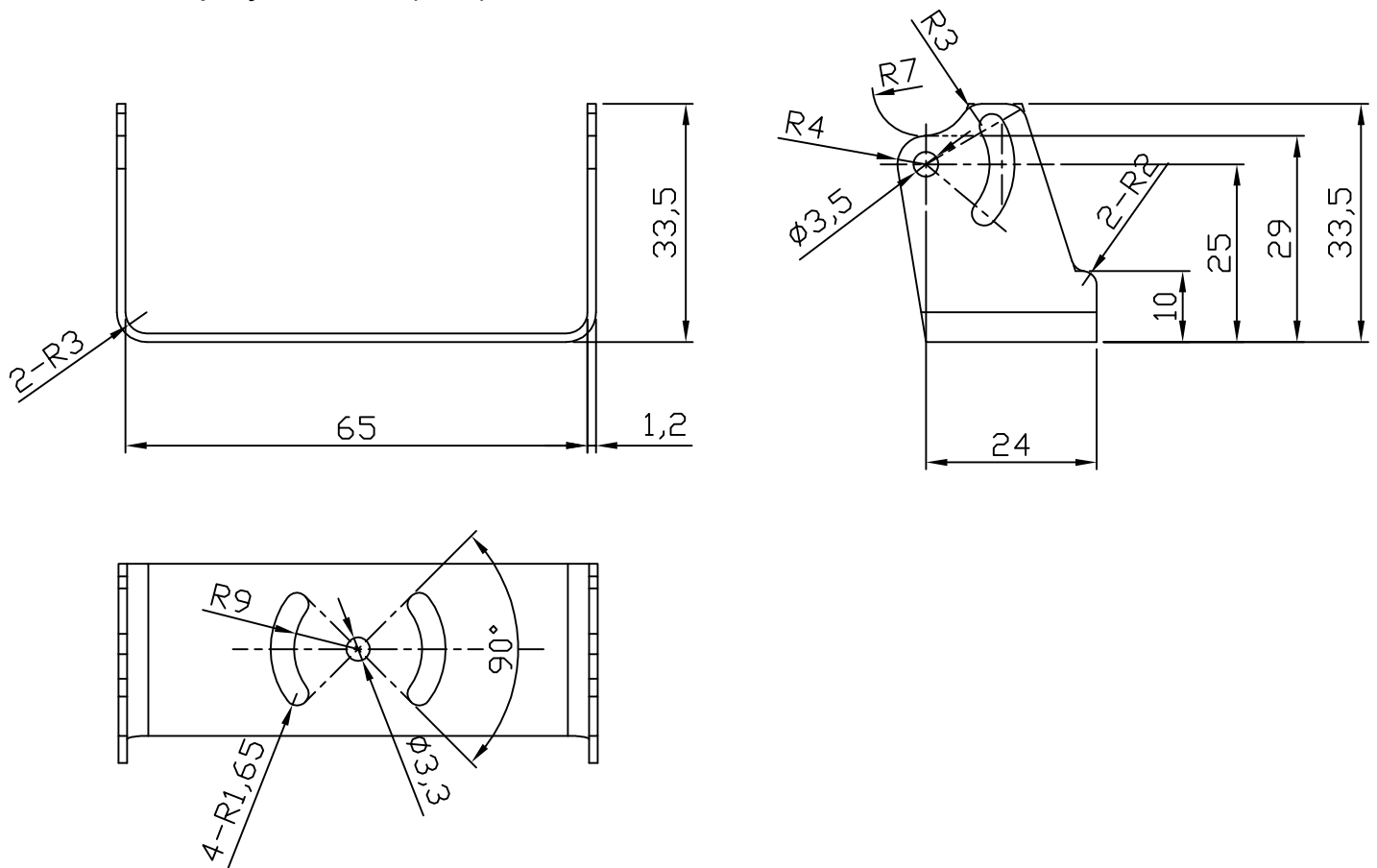
- Display units (mm)



- Radar Bracket (mm)



- Display Bracket (mm)





| |
|---|
| WARNING |
| RISK OF ELECTRIC SHOCK DO NOT OPEN |



To reduce the risk of electric shock do not remove cover(or back)
No user serviceable parts inside. Refer servicing to qualified service personnel.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Design and specification are subject to change without notice.

Developed and manufactured by Newest One Tech Co., Ltd



www.newest-one.com

A-607, 908, 910 DAEWOO TECHNO PARK, 261 DOYAK-RO
WONMI-GU, BUCHEON, Gyeonggi, Korea 14523
+82-2-949-0329