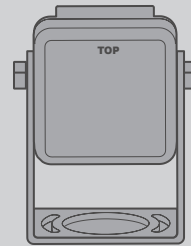
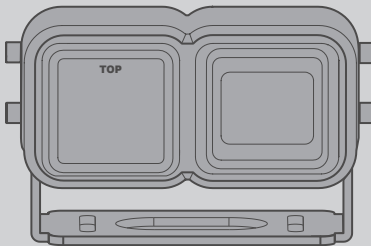
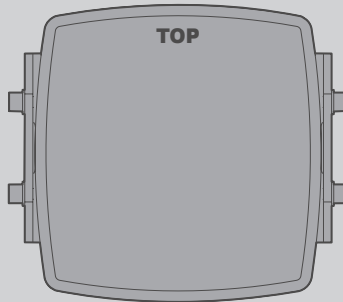


Programmable RADAR SENSOR

RM-02C / RM-06C / RC-06C



FEATURES

- Simple & easy-to-use
- 3 selectable modes
- Quick to install
- 24GHz FMCW Radar
- Waterproof & shock resistant

RM-02C

- Supplied Accessories —○ 05
- Dimension —○ 06
- Installation —○ 07
- Detection Pattern —○ 08
- Specification —○ 09

RM-06C

- Supplied Accessories —○ 11
- Dimension —○ 12
- Installation —○ 13
- Detection Pattern —○ 14
- Specification —○ 15

RC-06C

- Supplied Accessories —○ 17
- Dimension —○ 18
- Installation —○ 19
- How to adjust Normal and Mirror —○ 20
- Detection Pattern —○ 21
- Specification —○ 22

System Description

- The Smallest Radar Sensor Active Blind Spot Detection System for Light-Duty Vehicle.
- 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'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 receives 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 should be cleared of all obstacles.

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

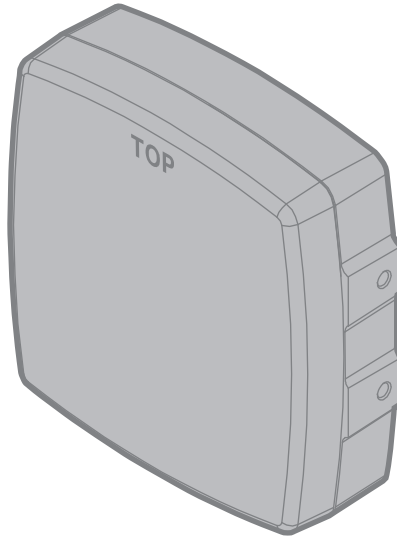
All dimensions for detection of objects are nominal and very significantly depending on many parameters.

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 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.



RM-02C

■ **Programable Radar (Mode 1~ Mode 3)**

■ **Detection Area (Meter)**

• **RM-02C (3050)**

-Mode 1 : 3.5 X 5.0

-Mode 2 : 4.5 X 6.0

-Mode 3 : 5.5 X 10

• **RM-02C (0830)**

-Mode 1 : 4.0 X 20

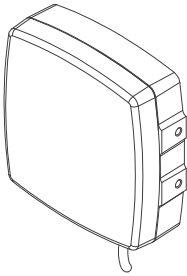
-Mode 2 : 6.0 X 25

-Mode 3 : 8.0 X 30

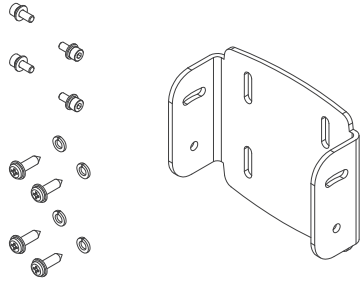
Supplied Accessories

■ Supplied Accessories

- Radar Sensor



- Wall Mount Included screw pack



- Extension Cable (Option)

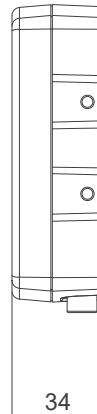
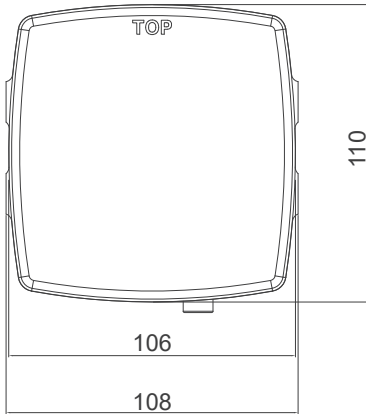


- User's Guide

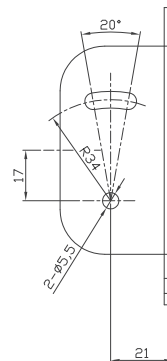
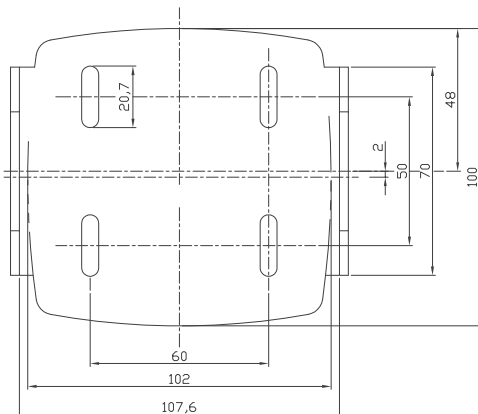


■ Dimension

- Radar Sensor (mm)



- Radar Bracket (mm)



Installation

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

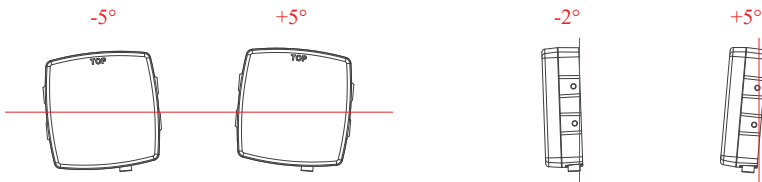
- Select the appropriate location to mount the sensor.
 - a. Height tolerance (from ground); 1m +/- 0.3m
 - b. Vertical angle tolerance +5° (up), -2° (down)
 - c. Horizontal angle tolerance +/- 5°

Note :

Before permanently installing the Radar 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.

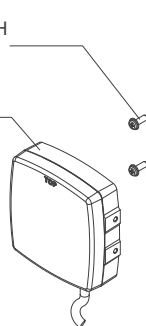
Our system is not affected if multiple systems are operating in the same area or on the same vehicle, even if they are installed in close proximity with overlapping detection ranges.



Radar Sensor Mounting angle

TAPPING SCREW PWH
T1 Ø5*15 SUS X 4 ea

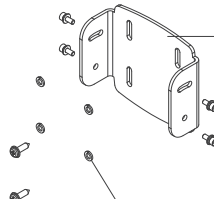
Radar Sensor



Bracket

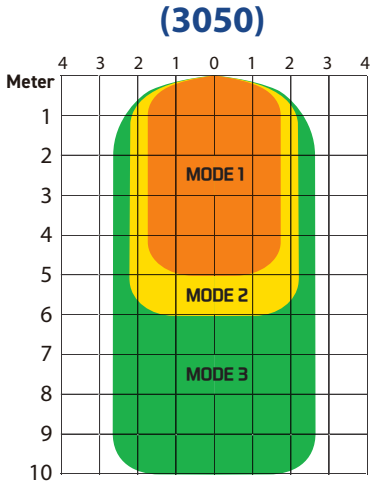
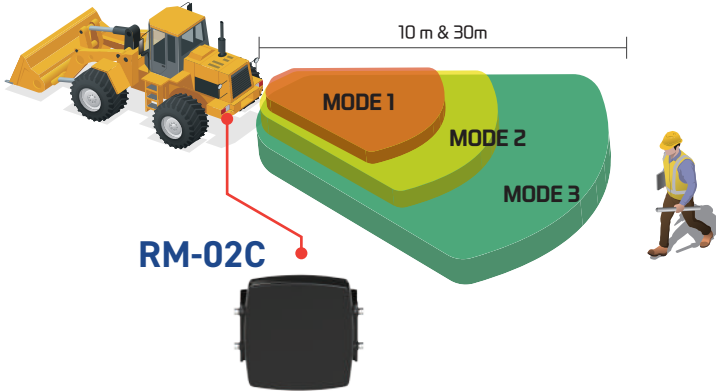
HSH SEM'S M5*12
SUS X 4 ea

SPRING WASHER
Ø5 SUS X 4 ea

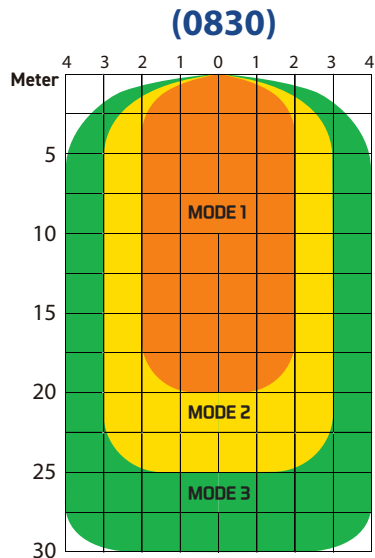


Radar Detection Zone

- Sensor Mode : • RM-02C (3050) Mode 1 ~ Mode 3
- RM-02C (0830) Mode 1 ~ Mode 3



- MODE 1 (3.5 X 5.0 M)
- MODE 2 (4.5 X 6.0 M)
- MODE 3 (5.5 X 10 M)

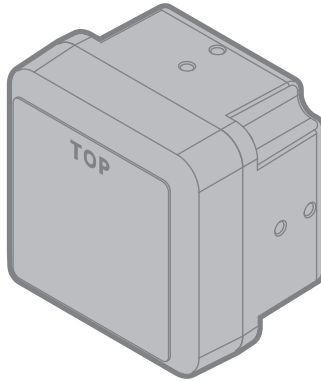


- MODE 1 (4.0 X 20 M)
- MODE 2 (6.0 X 25 M)
- MODE 3 (8.0 X 30 M)

Specification

■ Radar Sensor Technical Specification

PARAMETER	Value	Units	Condition
Transmit frequency	24.05 ~ 24.25	GHz	FCC, CE, KC
Modulation	FMCW (Frequency Modulated Continuous Wave)		
Supply voltage	12 ~ 32	V dc	
Current	133	mA@12V	
Power on time	300	ms	
Detection time	200	ms	
Communication	CAN-Bus		
Operating temperature	-40 ~ 85	°C	
IP protection rate	69K		
Vibration	15	G	
Housing material	Polycarbonate		
Dimension	110(W) x 108(L) x 34(H)	mm	
Weight	390	g	W/O Bracket
	720	g	with bracket



RM-06C

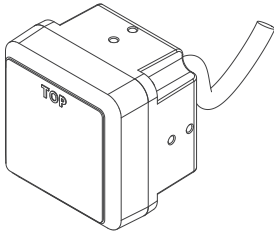
■ Programmable Radar (Mode 1~ Mode 3)

• Detection Area (Meter)

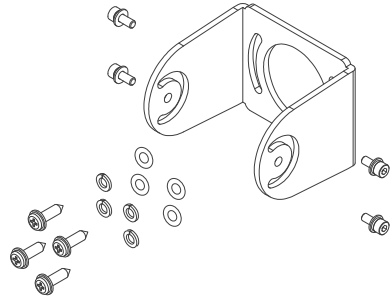
- Mode 1 : 2.0 X 3.0
- Mode 2 : 3.0 X 4.0
- Mode 3 : 3.0 X 5.5

Supplied Accessories

- Radar Sensor



- Wall Mount Included screw pack



- Extension Cable (Option)

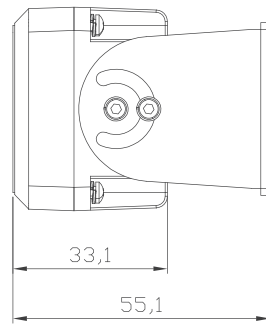
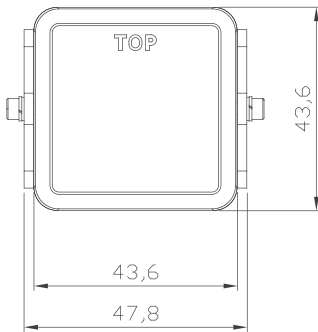


- User's Guide

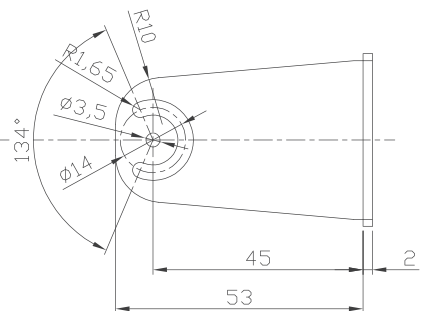
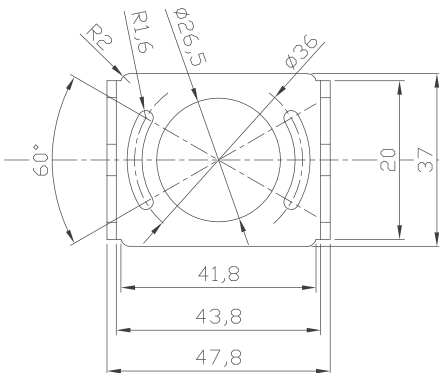


■ Dimension

- Radar Sensor (mm)



- Radar Bracket (mm)



Installation

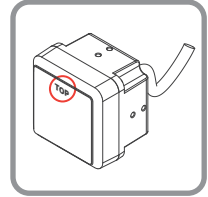
Installation

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.

Mounting angle

- Select the appropriate location to mount the sensor.
 - a. Height tolerance (from ground); 1m +/- 0.3m
 - b. Vertical angle tolerance +5° (up), -2° (down)
 - c. Horizontal angle tolerance +/- 5°

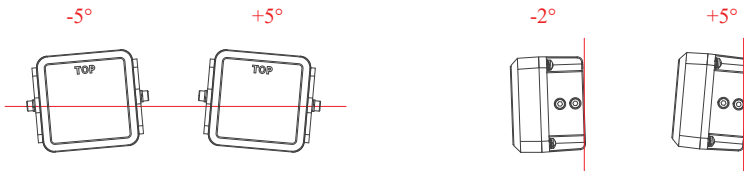


Note :

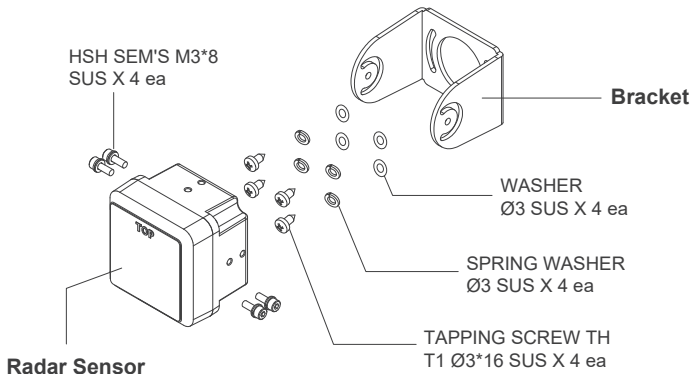
Before permanently installing the Radar on the vehicle, verify that the selected sensor mounting location provides a clear detection zone.

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.

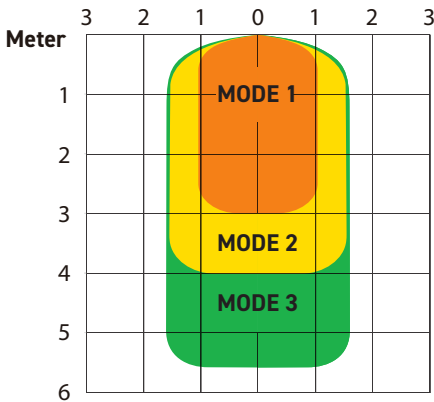
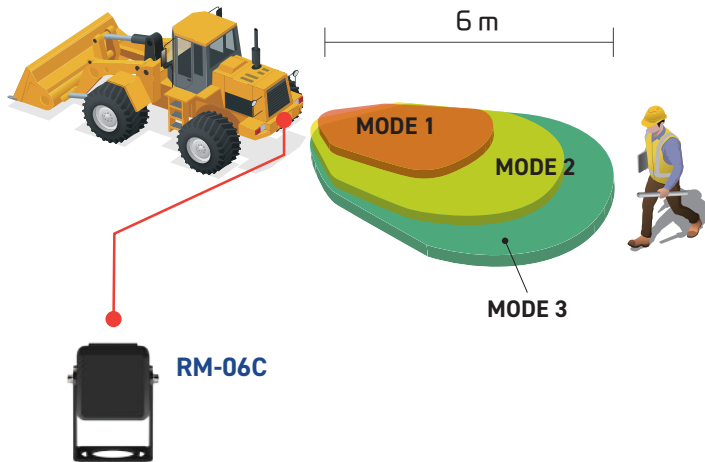


Radar Sensor Mounting angle



Radar Detection Zone

■ Sensor Mode : RM-06C (Mode 1 ~ Mode 3)

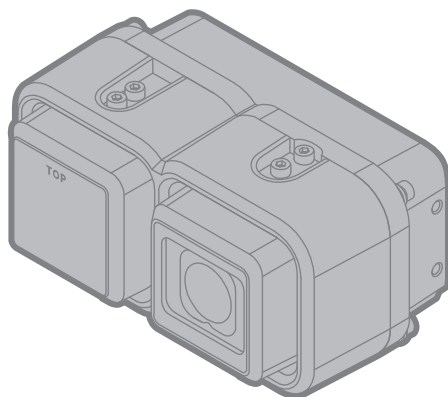


- MODE 1**
(2.0 X 3.0 M)
- MODE 2**
(3.0 X 4.0 M)
- MODE 3**
(3.0 X 5.5 M)

Specification

■ Radar Sensor Technical Specification

PARAMETER	Value	Units	Condition
Transmit frequency	24.05 ~ 24.25	GHz	FCC, CE, KC
Modulation	FMCW (Frequency Modulated Continuous Wave)		
Supply voltage	12 ~ 32	V dc	
Current	93	mA@12V	
Power on time	300	ms	
Detection time	200	ms	
Communication	CAN-Bus		
Operating temperature	-40 ~ 85	°C	
IP protection rate	69K		
Vibration	15	G	
Housing material	Polycarbonate		
Dimension	43.6(W) x 43.6(L) x 33.1(H)	mm	
Weight	175	g	W/O Bracket
	240	g	with bracket



RC-06C

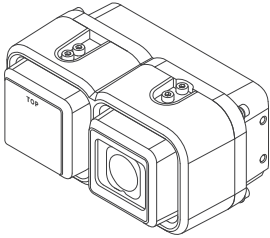
■ Programable Radar (Mode 1~ Mode 3)

• Detection Area (Meter)

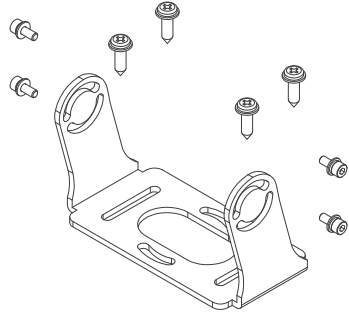
- Mode 1 : 2.0 X 3.0
- Mode 2 : 3.0 X 4.0
- Mode 3 : 3.0 X 5.5

Supplied Accessories

- Radar Sensor



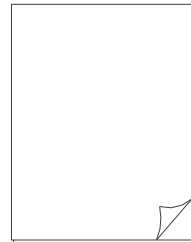
- Wall Mount Included screw pack



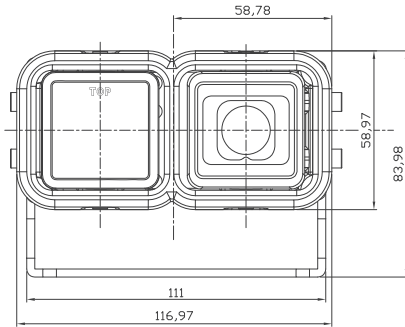
- Extension Cable (Option)



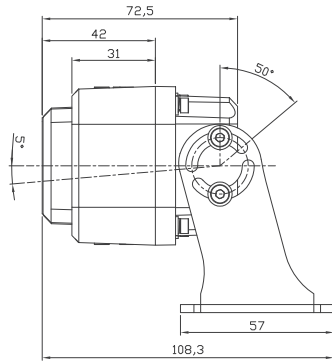
- User's Guide



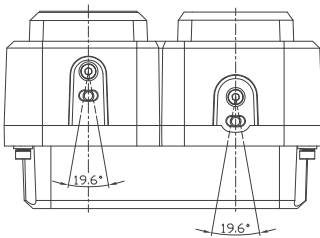
■ Dimension (mm)



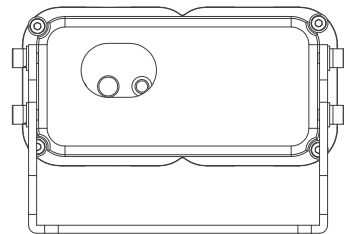
Front View



Side View



Left & Right Angle

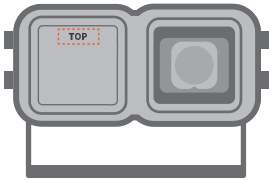


Rear View

Installation

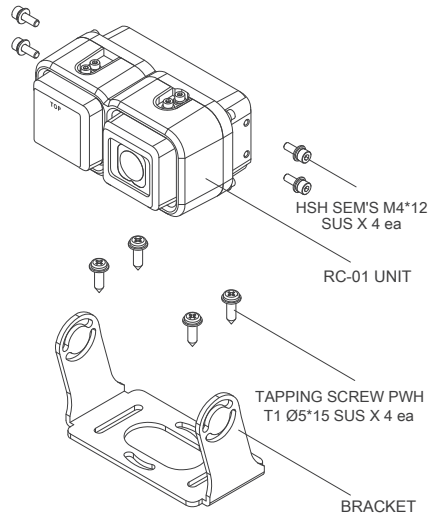
Radar Camera Mounting

- The installation site should be flat. Ideally the radar camera should be mounted on the rear of the vehicles as close to the center as possible.
- The "TOP" on the front of sensor should be facing pointing top (Refer to the image)

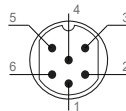


Mounting angle

- Select the appropriate location to mount the sensor.
 - a. Height tolerance (from ground), 1m +/- 0.3 m
 - b. Vertical angle tolerance +5 (up), -2° (down)
 - c. Horizontal angle tolerance +/- 5



Pin Connection



CONNECTION

PIN NO.	DESCRIPTION
1	Radar VCC (+)
2	CAN-L
3	GROUND (-)
4	CAN-H
5	Video
6	Audio

Note :

Our radar sensor is activated when the trigger is engaged.

RC-06C must be connected CAM 1 and the trigger 1 must be connected to the rear gear trigger for rearview camera.

Before permanently installing the radar camera 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.

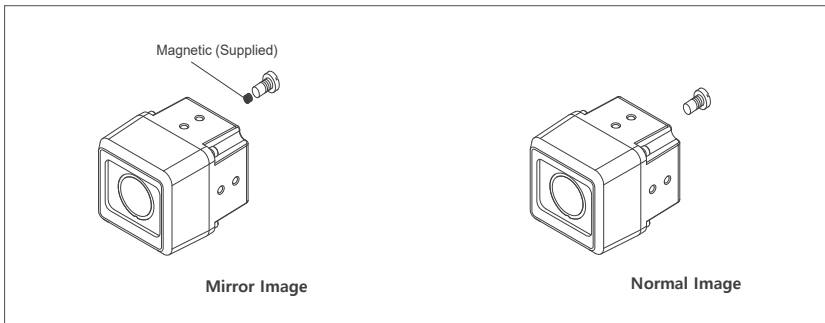
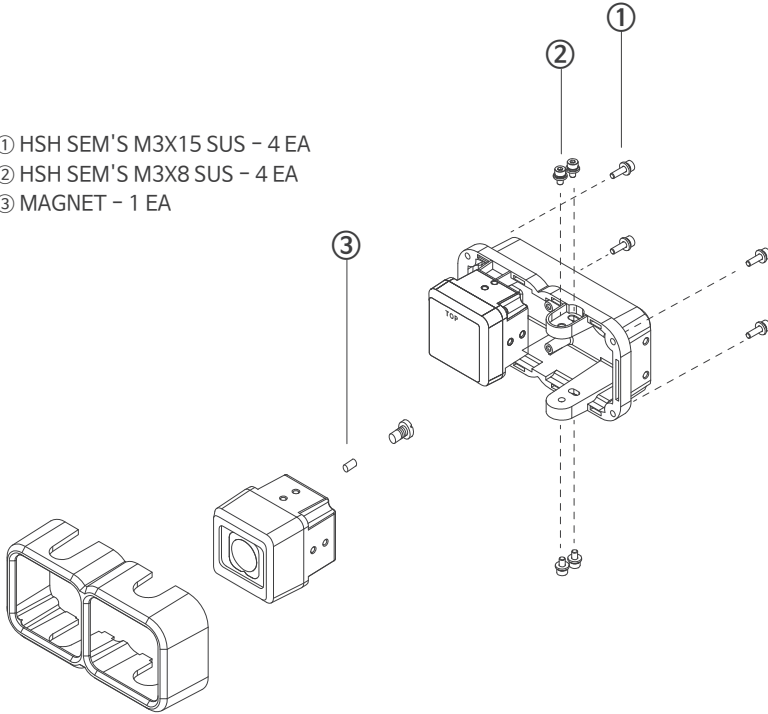
How to adjust Normal and Mirror

How to adjust Normal and Mirror

- 1) Unscrew No 1 (4 x screws) to take front case apart
- 2) Unscrew No 2 (4 x screws) to take camera apart
- 3) Take out the magnetic 3 for Normal image

※The default is Mirror

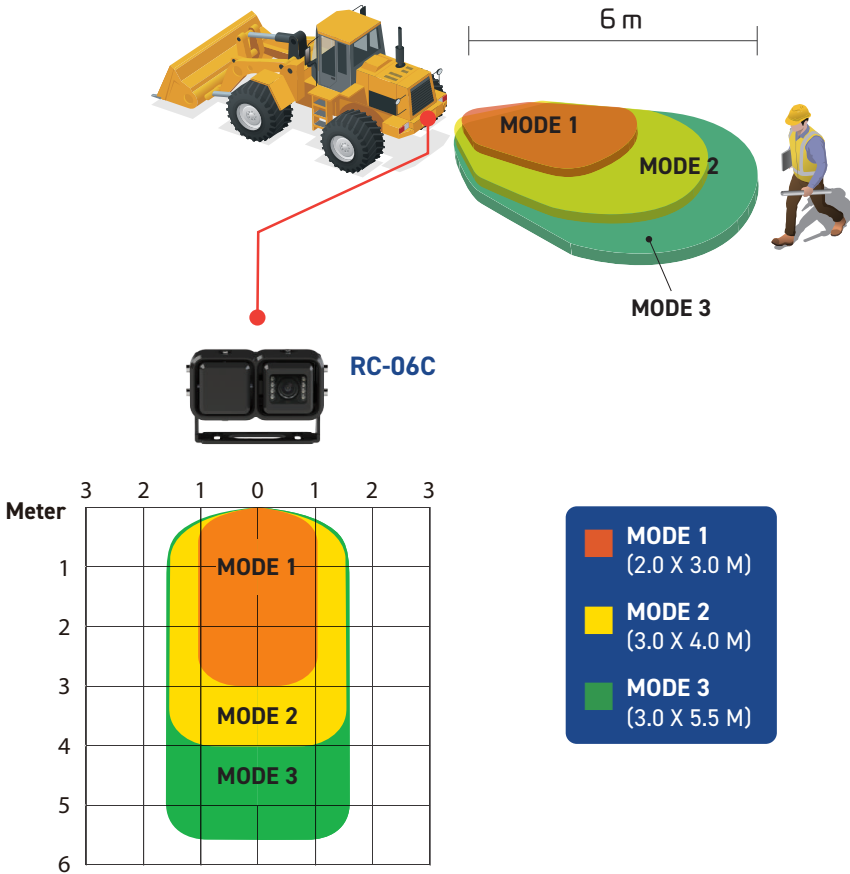
- ① HSH SEM'S M3X15 SUS - 4 EA
- ② HSH SEM'S M3X8 SUS - 4 EA
- ③ MAGNET - 1 EA



Detection Pattern

Radar Detection Zone

■ Sensor Mode : RC-06C (Mode 1 ~ Mode 3)



■ Camera and Radar Sensor Technical Specifications

● CAMERA

Image Sensor	1/2.9" SONY Progressive Scan CMOS Image Sensor
Total Pixels	2000(H) X 1121 (V)
Number of effective pixels	1984(H) X 1105(V), 2.19MP
Video Signal System	AHD, Internal, Option (CVBS, 960H)
Max, Video Resolution	1080p@30fps/25fps
Minimum Illumination	0Lux (With IR LED), 6Lux : LED ON , 25Lux : LED OFF
Lens	F2.0, 2.9mm 140°

● RADAR

Transmit frequency	24.05 ~ 24.25GHz (FCC, CE, KC)
Modulation	FMCW (Frequency Modulated Continuous Wave)
Detection time	Under 200ms
Communication	CAN-Bus
Power Input range	12V ~ 30V
Power Consumption	93mA@12V
Operating Temp	-30°C ~ 85°C
Storage Temp	-40°C ~ 85°C
Size	117(W) x 59(L) x 72.5(H)
Weight	475g (W/O Bracket)



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.**

Memo
