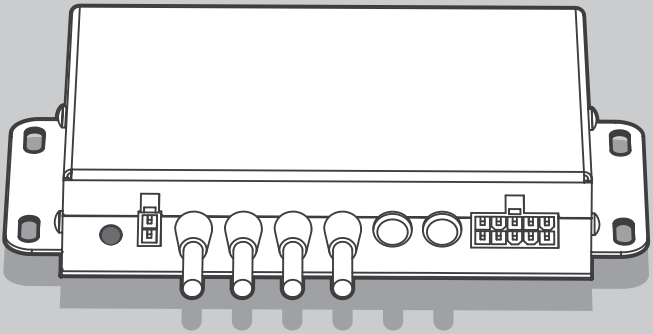
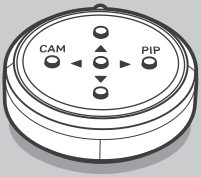
RADAR INTERFACE KITS

Obstacle Detection Radar On-Screen Display Kit

USER GUIDE





FEATURES

- Various video format compatible
  (AHD1080P, TVI1080P, AHD720P, TVI720P, CVBS 960H @ NTSC/PAL)
- Video out auto detection
  (AHD/TVI/CVBS @ 1080P/720P/960H, NTSC/PAL)
- Camera input auto detection
  (AHD/HD/TVI/CVBS @ 1080P/720P/960H, NTSC/PAL, All Shutter)
- Allow 3-stage audible and visual warning display
- Radar sensor error message display
- Support external warning alarm

READ INSTRUCTIONS BEFORE USING

- Please read and understand the manual and all other safety instructions before using this device.
- We are materially, mentally and for any casualty not responsible for accidents caused by not following the instructions given.
- The components of the device can be changed without notice for better quality.
- Use the original accessories and cables given by our company.
- We are not responsible for problems caused by not using the given components.
- Operating the device while driving can cause an accident.
- Please make it sure to park/stop in a safe place before using.
- Install the device where the driver's vision is not obstructed.
- Do not disconnect or connect the power cable while installing the device or using the device. It may cause damages to device.
- Do not use damaged power cables. It may cause fire and electric shock.
- Be careful not to touch the power with wet hands. It may cause electric shock.
- Avoid high-humidity, be careful not to allow water or debris inside the device.
- Do not apply excessive force to connected wires. It may become loose or disconnected.
- When cleaning the device, do not use chemicals or detergents.
  Wipe lightly with a soft cloth.
- If the cable is wired too close to the noise source of the car, please relocate the cables. The system may be influenced by it.
- If there is ice, snow, dust or mud on the surface of the radar, monitor and etc., it cannot be detected. Please do regular maintenance.
- When connecting the power cable, please check again if it is connected completely after inserting all the way to the connector.
- If the power cable is not connected completely, the cable can be disconnected while driving due to the car vibrations.
- Do not disassemble or apply excessive force to device.
  Please contact the manufacturer or supplier in case of any failure.
- We do not guarantee any problems caused by disassembling the devices.

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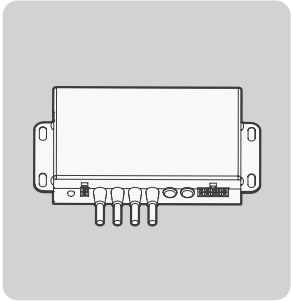
Specifications



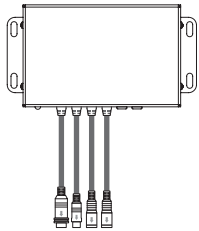
Description

Radar interface kit is a device used to integrate the radar sensor with a conventional AHD/CVBS camera and AHD/CVBS monitor systems.
It provides the driver with in-cab visual and audible warnings overlaid on to camera images on-screen.
This combination of object detection warnings and video images allows the machine operator to view all pertinent information in a single location reducing the number of systems.
It supports for auto detection both video out and camera input.

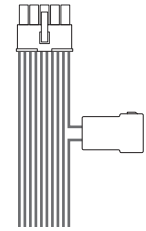
Operation Characteristics	
Video Input	Video Format : AHD1080P, TVI1080P, AHD720P, TVI720P, CVBS 960H @ NTSC/PAL Function : Support All Shutter Camera
Video Output	AHD/TVI (1080P/720P @ NTSC/PAL), CVBS (960H @ NTSC/PAL), Analog Output, 1CH
Audio Input	Camera Mic Input (MAX. 3 Vp-p)
Audio Output	MAX. 3Vp-p (CAM MIC & Radar detection warning sound) Camera MIC go through & Radar detection warning sound (MAX. 3Vp-p)
Power Input	DC7V ~ 32V 2.5W (210mA ±20mA @ 12V) / Radar Interface Kits only DC10V ~ 32V 4.8W (480mA ±20mA @ 10V) / Radar & Camera 1EA (RM-06C & SDC-H31C)
Radar Input	CAN Interface Radar sensor (MAX. 2CH Option)
Tacho Input	Tachometer Signal Input (5Hz ~ 105Hz)
Alarm Output	Active - Switch to ground, sink up to 1 A, over current protection, Inactive - High Impedance
Trigger Input	Trigger Input 1~2 (DC9V ~ 32V)
Trigger Output	Trigger Output 1 (DC12V ±0.5V @ 0.1A), @ DC24V input
Display Mode	CAM1, CAM2, SPLIT1, SPLIT2, SPLIT3, PIP1, PIP2, PIP3, PIP4
OSD	Multi-Language (ENGLISH, DEUTSCHE, JAPANESE, ITALIANO, FRANCAIS, ESPANOL, NEDERLANDS, SUOMI, SVENSK)
Operating Temp.	-20°C ~ +70°C / -4°F ~ +158°F
Storage Temp.	-30°C ~ +85°C / -22°F ~ +185°F
Dimension	167(W) × 90(L) × 30.6(H) mm / 6.57(W) × 3.54(L) × 1.20(H) inch
Weight	518g / 1.14lb

Supplied Accessories

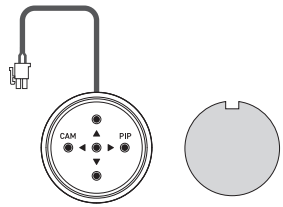
- ECU (Electronic control unit)



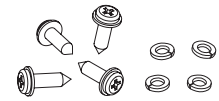
- Power Cable



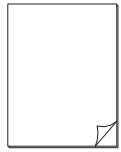
- OSD Controller



- Screw & Spring Washer



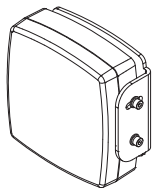
- User's Guide



- Extension Cable (Option)

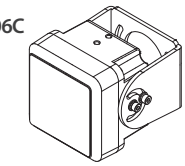
- Radar Sensor (Option)

RM-02C



- Radar Sensor (Option)

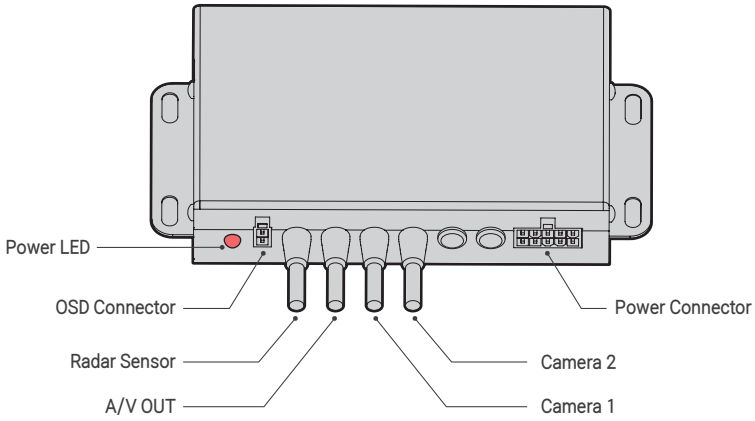
RM-06C



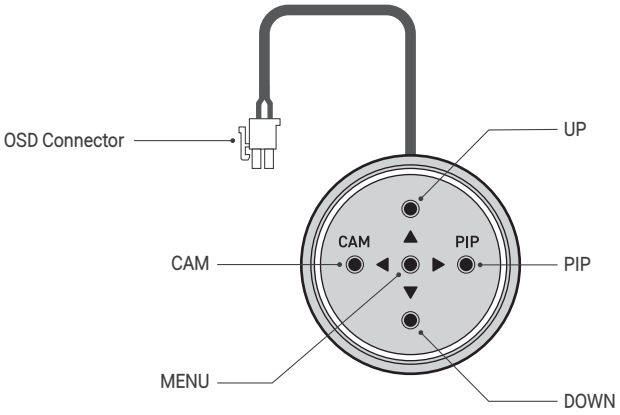
Installation and Connections

1. Name of Each Part

- ECU (Electronic control unit)

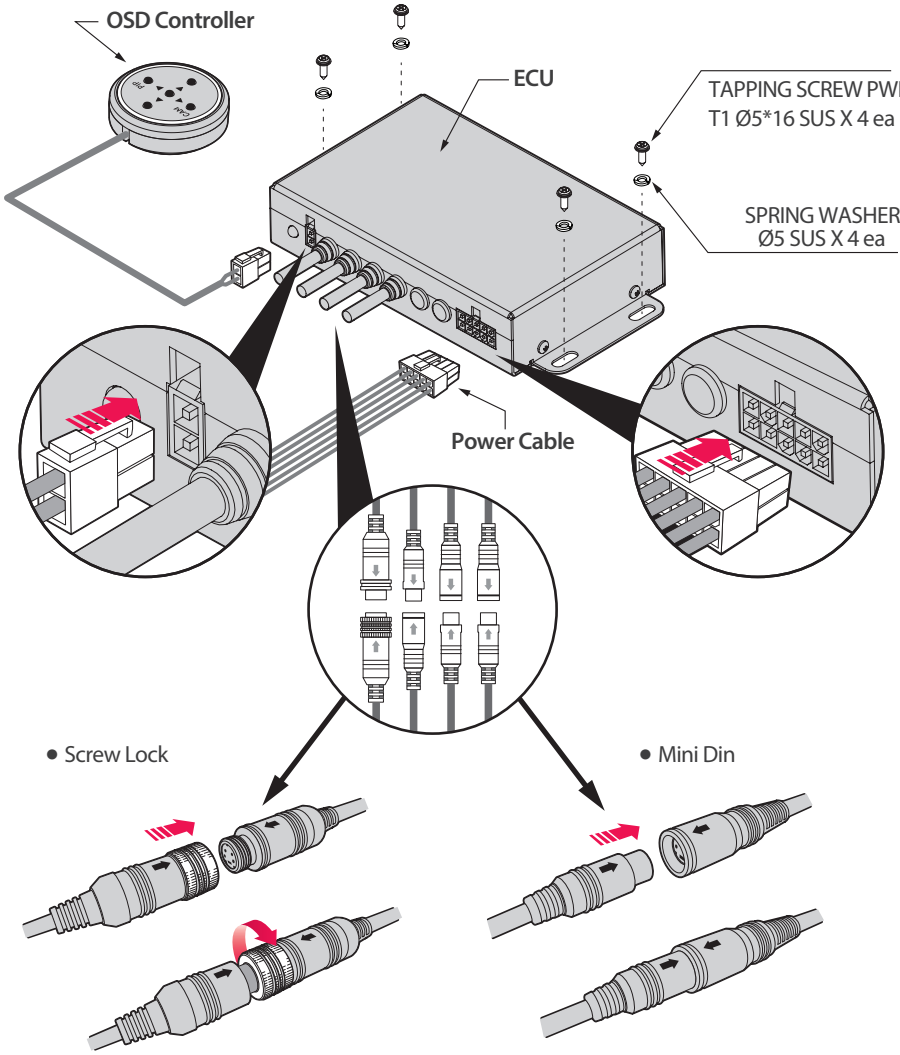


- OSD Controller



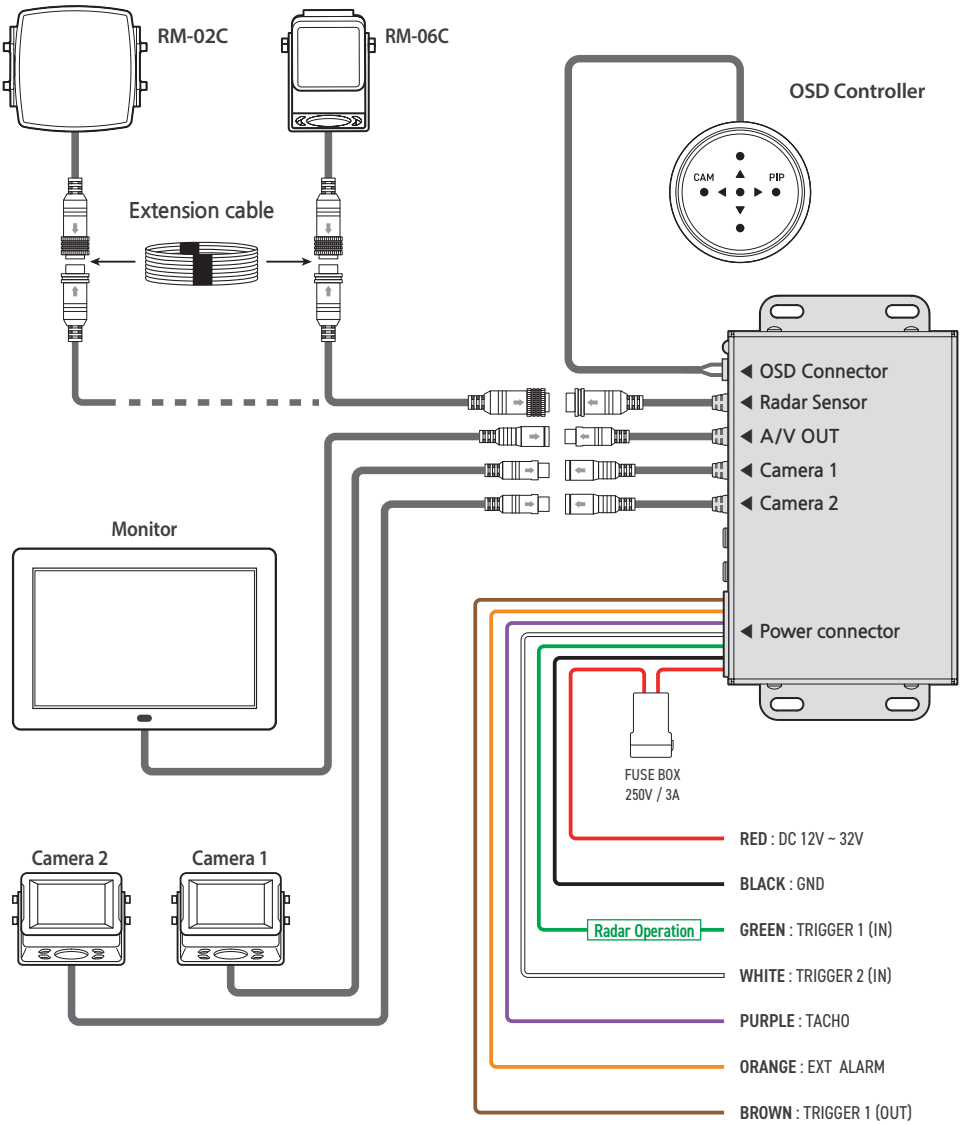
2. ECU System Connections

※ When connecting the power cable, please check again if it is connected completely after inserting all the way to the connector.
※ If the power cable is not connected completely, the cable can be disconnected while driving due to the car vibrations.
※ It must be installed in a dray location inside the vehicle cabin. It may be installed in any orientation but must be mounted to a flat surface.



Installation and Connections

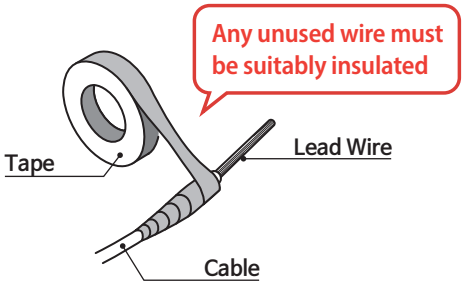
3. System Configuration and Connection



Note : 1. The radar works when the **"Trigger 1 (IN)"** is connected.
2. Alarm out cable is switch to ground, when an object is detected within the detection area.

• Electrical Wiring Connections

Color	Item	Specifications
● RED	DC 12V ~ 32V	System supply. (3A blade fuse) Red cable to non-permanent power supply.
● BLACK	GND	Supply negative. (Ground) Black cable to ground.
● GREEN	TRIGGER 1 - IN (Radar Operation)	Trigger from vehicle, high active. (Range +9Vdc~32Vdc) Green cable (Trigger 1) for radar sensor activation(e.g reverse or other vehicle signal) This activation input changes the status of Sensor 1 from standby to active.
○ WHITE	TRIGGER 2 - IN	Trigger from vehicle, high active. (Range +9Vdc~32Vdc)
● PURPLE	TACHO - IN	Signal Input. (5Hz ~ 105Hz) Purple cable (Tacho) for speed signal cable.
● ORANGE	EXT ALARM - OUT	Switched to Ground when active. (Loading up to 1A) Orange cable (Ext Alarm out) is a trigger output to activate an external device (Alarm or beacon) It is switched to ground when an object is detected in detection area.
● BROWN	TRIGGER 1 - OUT	+12Vdc ±0.5 (Loading up to 0.1A) / @ DC24V input / to be synchronized with the Ext alarm Brown, Gray (Trigger 1, 2 out) 12V DC output to activate an monitor with trigger input. (To activate the trigger 1 out, Alarm out menu must setup with **ZONE ALL** because the trigger 1 out is related Ext Alarm out cable : Refer to 17 page)



• CAMERA 1~2

CAMERA CONNECTION

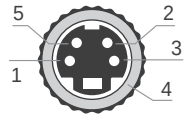
PIN NO.	DESCRIPTION
1	VCC (+)
2	SHUTTER
3	VIDEO
4	GROUND (-)
5	AUDIO

• A/V OUT

A/V OUT CONNECTION

PIN NO.	DESCRIPTION
1	VIDEO
2	AUDIO
3	N.C
4	GROUND (-)
5	N.C

• RADAR SENSOR



RADAR CONNECTION

PIN NO.	DESCRIPTION
1	RADAR VCC (+)
2	N.C
3	CAN-H
4	GROUND (-)
5	CAN-L

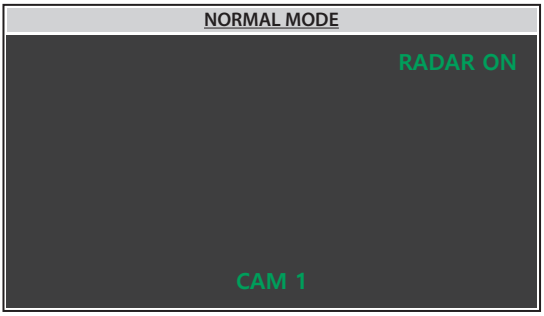
Button Explanation

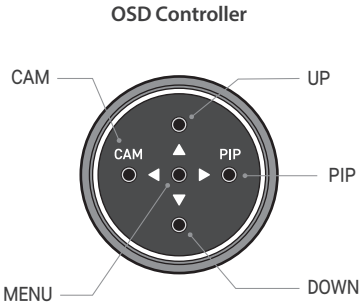
4. OSD Controller Function

Normal display status

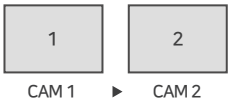
※ After completing settings, make sure to separate OSD Controller from ECU.
It may cause malfunctions.

※ Depending on the monitor's features, the image may be blurred or the Font may look fuzzy.

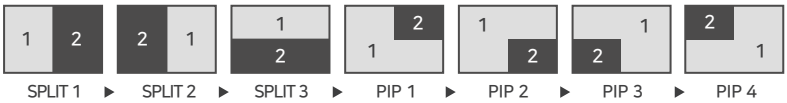




• CAM button (Left) : CAM1 ~ CAM2



• PIP button (Right) : SPLIT / PIP



- DOWN button : Version Display
  ※ Press for 3 seconds

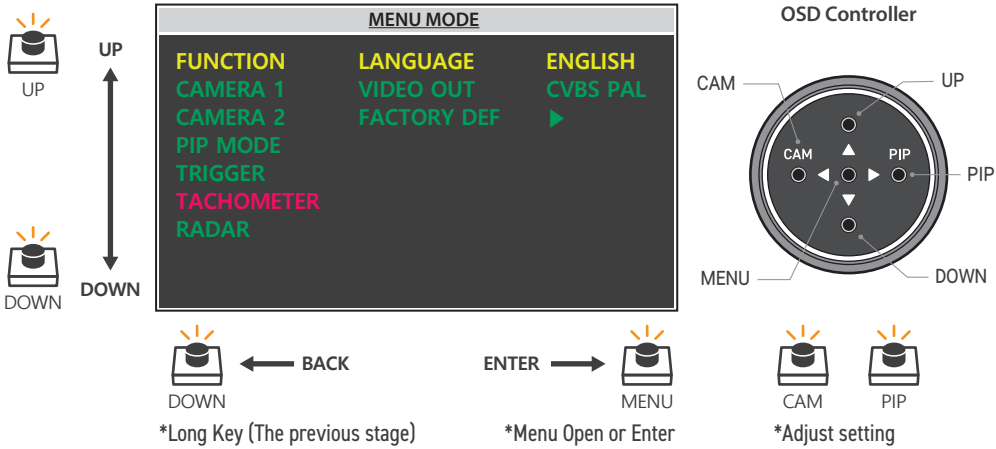
- UP button : Factory Reset
  ※ Press for 3 seconds

- MENU button : Open the Menu or Enter

Menu display status

※ After completing settings, make sure to separate OSD Controller from ECU.
It may cause malfunctions.

※ Depending on the monitor's features, the image may be blurred or the Font may look fuzzy.

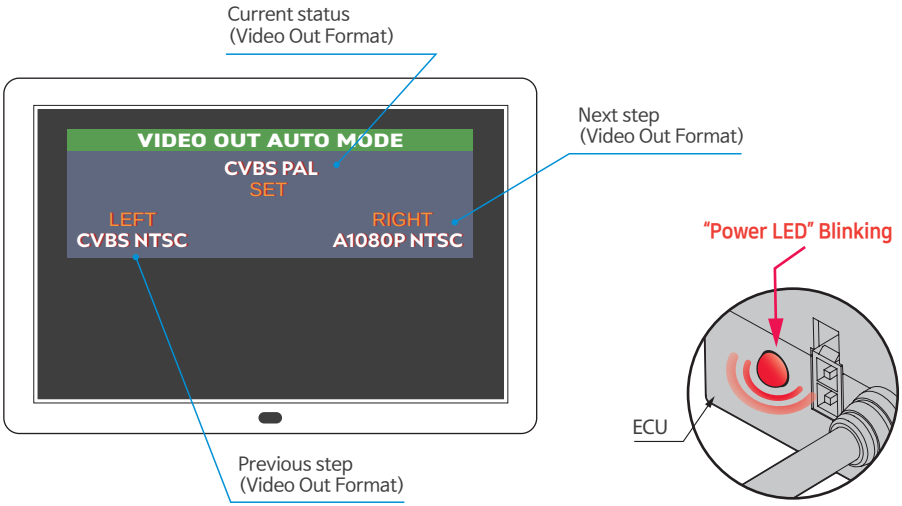


Video Out Synchronization Setting

5. Synchronization Settings (ECU + Monitor)

VIDEO OUT AUTO MODE

● How to execute Video Out Auto Mode.



① Connect the OSD controller to the ECU.

② Apply power to ECU and monitor.

③ Press both UP and Down buttons simultaneously for **3 seconds until Power LED(red)** is blinking on the ECU.

④ When the red LED starts blinking, **" VIDEO OUT AUTO MODE "** is activated.

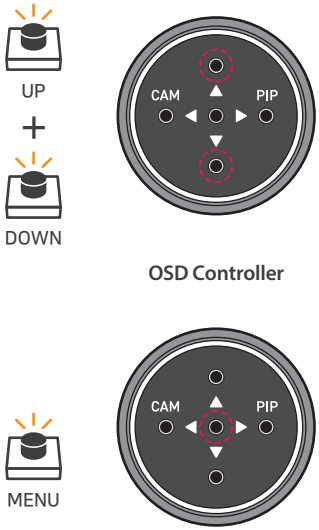
⑤ It starts **Auto Scanning of 10 system formats** in every 8 seconds.

⑥ **Press "SET" button to save video out format within 7~8 second**, when you find the above image like OSD window clearly.

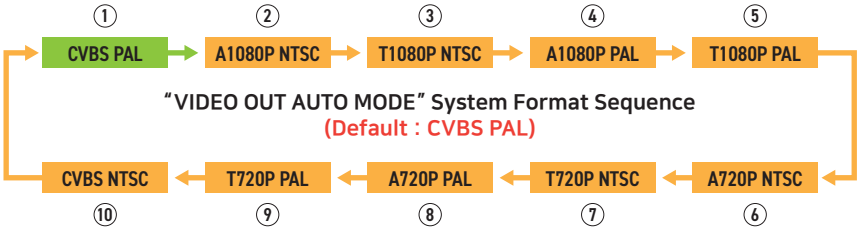
※ When the video out format is saved, Power LED(red) is on, not blinking anymore.

※ If you miss to press SET button within 7~8 seconds,
1) Press " Right" or "Left" and move to next / previous step
2) Or you have to wait again during auto scan mode.

⑦ Remove the OSD controller after ECU Power off.



Video Out Synchronization Setting

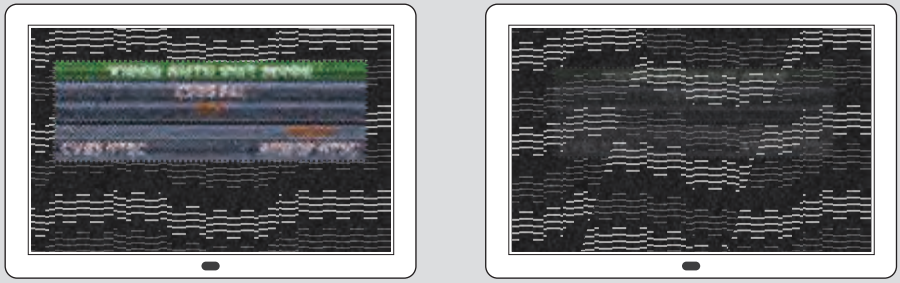


Note :

1. Auto Scan of Video format (as the above image) 1 ~ 10, each scanning time is 8 seconds and up to 80 ~ 85 sec.
2. If you miss to press MENU button within 7~8 seconds,
   1) Press "PIP(Right)" or "CAM(Left)" and move to next / previous step
   2) Or you have to wait again during auto scan mode.
3. AHD and TVI marked with initial. Like(AHD → A / TVI → T)

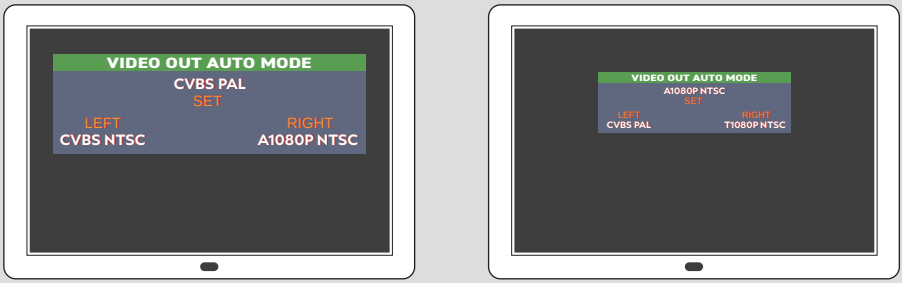
● Video Out Auto Mode Display Example

∗ Example 1 **(Bad)**



※ Malfunction can be shown differently depending on monitor type.
(This photo shows a typical example.)

∗ Example 2 **(Good)**



※ If the Monitor installed on vehicle matchs up with ECU Format,
it shows the screen normally and clearly as shown in the photo.

6. Menu Structure

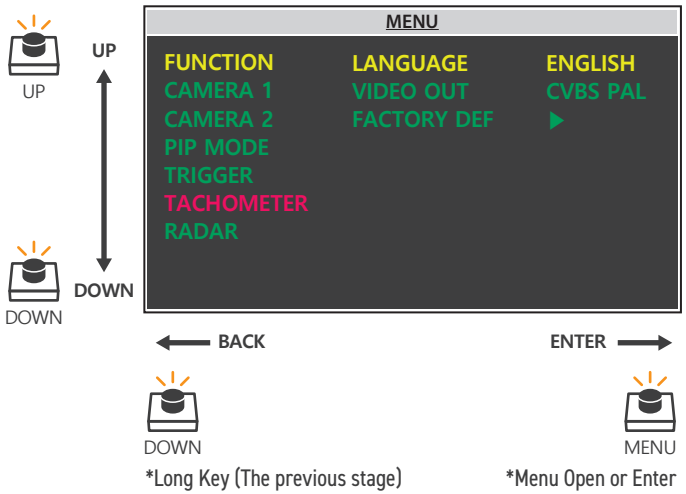
Menu display status

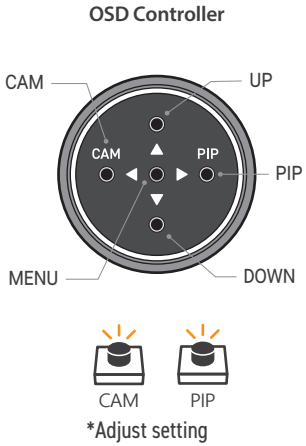
- OSD Color Explanation : Green (Normal), Yellow (Selected Menu),
  Red (When "Tachometer" and "Park. Line" mode are setup off,
  the green OSD is changed to Red)

Menu mode button

※ After completing settings, make sure to separate OSD Controller from ECU.
It may cause malfunctions.

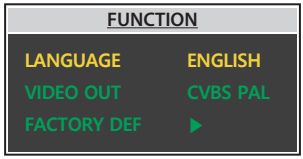
※ Depending on the monitor's features, the image may be blurred or the Font may look fuzzy.





- UP BUTTON : Move to the upper option in Menu Tree.
- DOWN BUTTON : ① Move to the lower option if you press shortly in Menu Tree.
  ② Move to the previous page if you press 1 ~ 2 sec in Menu Tree.
- PIP(Right) / CAM(Left) : Adjust setting.
- MENU BUTTON : Open the Menu or Move to the next page and choose.
  ※ Menu Tree disappears after 10 secs, the settings will be saved.

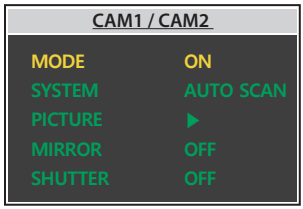
Menu Setting



① **FUNCTION** : Change the following setting below

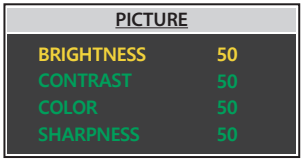
- LANGUAGE : Language selection (Default: English)
  ※ Multi-Language (ENGLISH, DEUTSCHE, JAPANESE, ITALIANO, FRANCAIS, ESPANOL, NEDERLANDS, SUOMI, SVENSK)
- VIDEO OUT : Video Out selection. (Default : CVBS PAL)
  ※ A1080P NTSC, T1080P NTSC, A1080P PAL, T1080P PAL, A720P NTSC, T720P NTSC, A720P PAL, T720P PAL, CVBS NTSC, CVBS PAL
  ※ AHD and TVI marked with initial as. (AHD ➡ A / TVI ➡ T)
- FACTORY DEF : Press " SET " key to reset to factory mode.
  ※ When you find video error or abnormal operation, please execute "Factory Def"

② **CAMERA1~2** : Camera setting



- MODE : ON / OFF
- SYSTEM : **Camera system format Selection. (Default : AUTO SCAN)**
  - AUTO SCAN, A1080P NTSC, T1080P NTSC, A1080P PAL, T1080P PAL, A720P NTSC, T720P NTSC, A720P PAL, T720P PAL, CVBS NTSC, CVBS PAL
  - AHD and TVI marked with initial as. (AHD ➡ A / TVI ➡ T)
  - Adjust the required camera system at system mode. If the camera is not adjusted correctly, the image is not properly displayed.
  - When you select "Auto Scan", the each camera systems is automatically setup and it will take some time to display proper camera image.
  - If the monitor (screen) is in black and white or abnormal, adjust individually.
  - Do not connect both NTSC and PAL Camera at the same time.
    ex) CAM 1 (PAL) and CAM 2 (NTSC) do not display properly.
- PICTURE : Adjust "Brightness, Contrast, Color & Sharpness "
- MIRROR : Enable this option to mirror the image. (Left/Right)
- SHUTTER : Shutter camera Selection.

③ **PICTURE** : Adjust Setting (Default : 50)

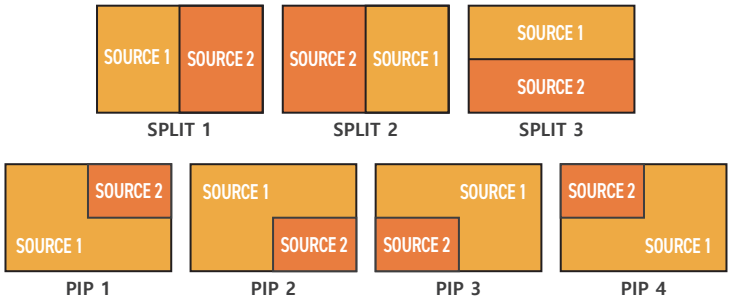


- BRIGHTNESS : 0~99
- CONTRAST : 0~99
- COLOR : 0~99
- SHARPNESS : 0~99

System Setting

④ **SPLIT1~3 / PIP1~4** : Display the camera video at the set position on the SPLIT screen.

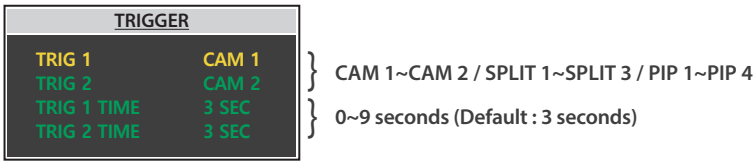
- MODE : ON / OFF
- SOURCE 1~2 : Display the camera video at the set position.
- AUDIO : The selected camera audio.



⑤ **TRIGGER** : Settings related to display a camera based on trigger signal

- Trigger 1~2 : User can select 2 different triggers and each trigger source can be selected
- Trigger time : Time that takes to return to the previous menu after triggers.

» TRIGGER PRIORITY: TRIGGER 1 > TRIGGER 2



⑥ **TACHO** : Settings related to switching a camera based on tacho speed

- MODE : ON / OFF
- Over Freq: Select the required mode to display image, when input is higher than frequency setting.
- Under Freq : Select the required mode to display image, when input is lower than frequency setting.
- Time : Time that takes to return from Under FREQ Mode to Over FREQ Mode.
- FREQUENCY : Adjust FREQUENCY into 67Hz

※67Hz setting (most common used tacho signal)
The selected camera will be displayed during a speed of 0~33km/h.

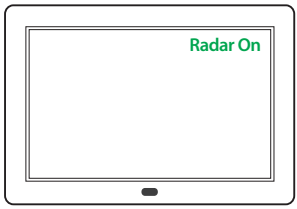
TACHOMETER		
MODE	OFF	← ON/OFF
OVER FREQ	SPLIT 2	← CAM 1~2 / SPLIT 1~3 / PIP 1~4 (Default : SPLIT 2)
UNDER FREQ	SPLIT 1	← CAM 1~2 / SPLIT 1~3 / PIP 1~4 (Default : SPLIT 1)
TIME	3 SEC	← 0~9 seconds (Default : 3 seconds)
FREQUENCY	67 Hz	← 5~105 Hz (Default : 67Hz)

- **Example of Tachometer [Speed switch] Function**

* The Tacho wire needs to be connected with the vehicle's tacho signal and via MENU, the Tachometer mode needs to be selected ON.
* Adjust FREQUENCY into 67Hz. At this setting (and most common used tacho signal), the selected camera will be displayed during a speed of 0~33km/h.
* Select the required mode for display image at both "OVER FREQ" and "UNDER FREQ"
(At different types of tacho signals, the FREQUENCY needs to be adjusted into higher or lower value than this example)

Radar Menu

- **Radar On** : The radar sensor is stand-by.
- **Radar ERR** : Radar Sensor is not properly setup with radar monitor.
- **COM Error** : No communication, please contact the supplier.
- **No Cable** : Cable is not connected. Please check the cable is properly connected. If still "No Cable" on the screen, please contact the supplier



Radar monitor system configuration

- RM-02C/06C (Radar sensor)

Our radar sensor is activated when the trigger is engaged.
RM-02C/06C must be connected to the connector with "RM" marked and the trigger 1 is for Radar sensor.

How to setup radar sensor

- MODE : ON / OFF (Please adjust "On" for Radar sensor Activation)
- SETUP : Go to " Setup " to setup Radar menu.

RADAR	
MODE	ON
SETUP	▶

System Setting

● Type : Programmable / Fixed
- Programmable Radar : You can adjust Mode 1 ~ 3.
- Fixed Radar : The detection zone is only one. (Option)

● Detection : 1 ~ 3
- Detection Area for each radar sensor.
- To adjust "Detection Mode 1 ~ 3 with Programmable radar sensor (RM-02C/RM-06C)
  *Refer to the detection area for each mode
- The screen shows "OK" when you saved the mode normally.
- The screen shows "Fail" when you saved the mode abnormally.
  (The screen also shows "Fail" if there is no cable, Radar Mode Off and the connect is unstable.)

SETUP	
TYPE	Programmable
DETECTION	1
ALARM OUT	ZONE ALL

● Alarm out : OFF / ZONE 1 / ZONE ALL
- To activate external devices (Alarm or light)
- Alarm out cable is switch to ground, when an object is detected within the detection area.
- OFF : No activation
- ZONE 1 : Switch to ground at the closest zone for external devices
- ZONE ALL : Switch to ground all zone for external devices

※ When your device is RM-02C/RM-06C, please select "Programmable " at type mode then adjust detection mode 1~3 at detection mode.

Type		Detection Area(Meter)
Programmable Radar (Mode 1 ~ Mode 3)	RM-02C (3050)	Mode 1 : 3.5 x 5.0(L) Mode 2 : 4.5 x 6.0(L) Mode 3 : 5.5 x 10(L)
	RM-02C (0830)	Mode 1 : 4.0 x 20(L) Mode 2 : 6.0 x 25(L) Mode 3 : 8.0 x 30(L)
	RM-06C	Mode 1 : 2.0 x 3.0(L) Mode 2 : 3.0 x 4.0(L) Mode 3 : 3.0 x 5.5(L)

Radar detection zone display

① Select Type : Programmable with PIP(Right) or CAM(Left) button.
② Move to "Detection mode" with Up/Down button.
③ Press "MENU" button at Detection mode ▶ Detection mode "1" is blinking.
▶ Select the desired mode [1, 2 or 3] with PIP(Right) or CAM(Left) button ▶ Press Set button to setup the desired mode.
※ When the detection mode setup, the selected "1, 2, or 3" is not blinking anymore.
※ Please make sure that the desired mode is accordingly setup before using Radar sensor.

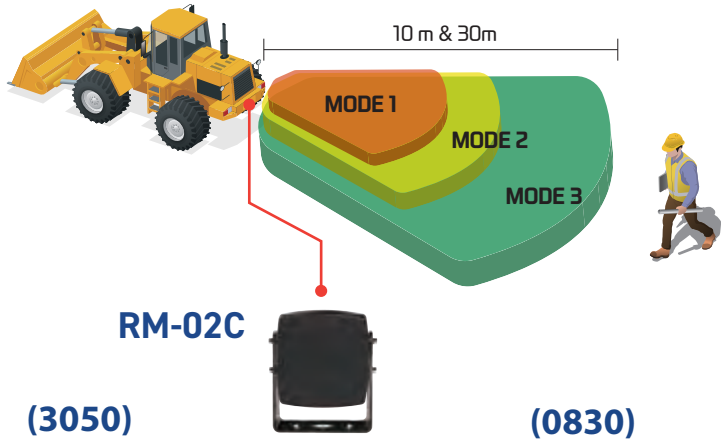
ZONE 3
Furthest Detection

ZONE 2

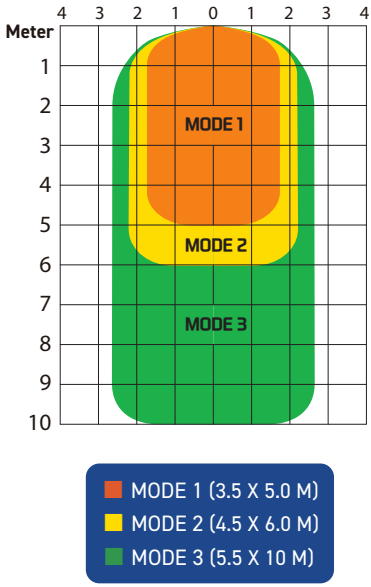
ZONE 1
Closest Detection

7. Radar Detection Mode

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

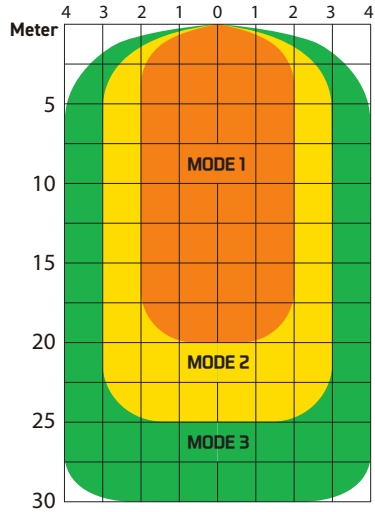


(3050)



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

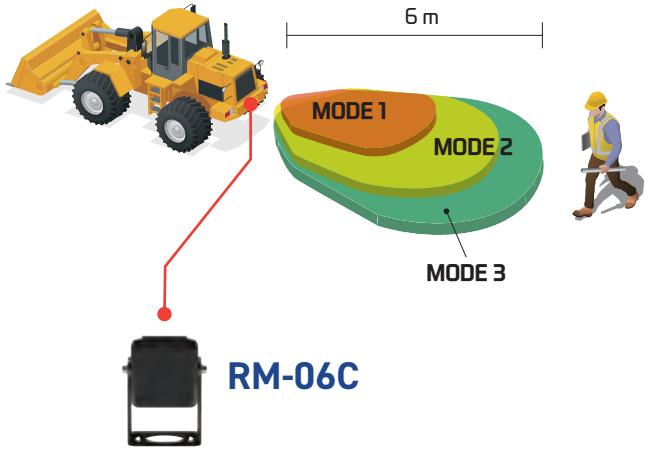
(0830)

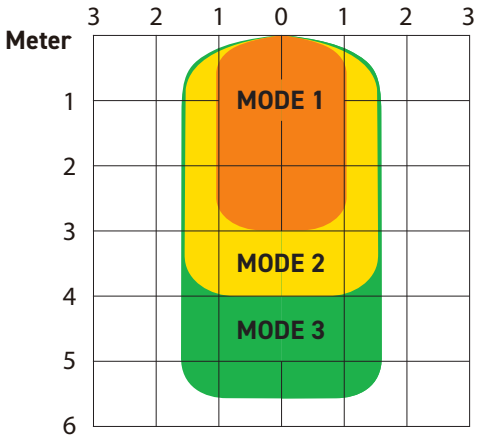


MODE 1 (4.0 X 20 M)
MODE 2 (6.0 X 25 M)
MODE 3 (8.0 X 30 M)

Detection Mode for Radar Sensor

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)