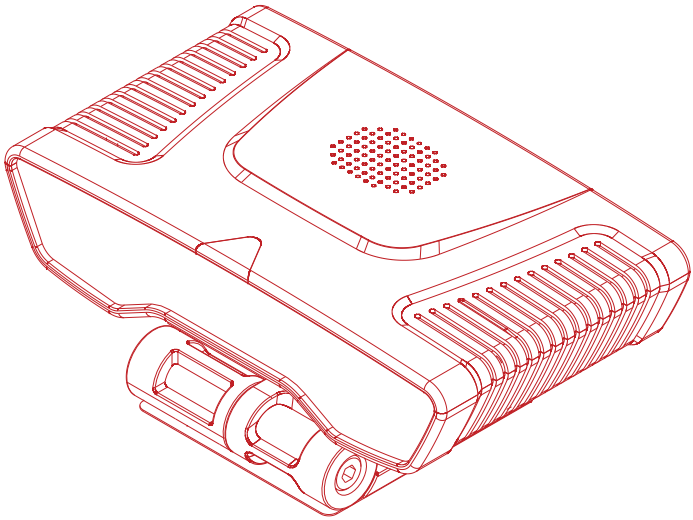
USER'S MANUAL

Driver State Monitor



How to use the product and caution required

- This product is an assist device that detects a driver falling asleep or taking his eyes off the road while at the steering wheel and issues a warning to reduce accidents that may occur as a result of the negligence of the driver.

- When the product is wet, do not place it on top of a heating device(e.g. heater or microwave) to dry it. (Doing so may cause an explosion or break down. Any breakdown of the product caused by not heeding this advice shall not be eligible for free after-sales repairs.)

- Do not use chemical substances (e.g. benzene, thinner or alcohol) or deter gent to clean the product. (Doing so may cause a fire. Any breakdown of the product caused by not heeding this advice shall not be eligible for free after -sales repairs.)

- Do not disassemble or apply shock to the product without the guidance of a specialist. (Doing so may cause a breakdown of the product. Any breakdown of the product caused by not heeding this advice shall not be eligible for free after-sales repairs.)

- Do not install or manipulate the product during its operation. (Doing so may cause an accident. If installation or manipulation is necessary, park the vehicle in a safe place before the installation or manipulation.)

- The recognition rate of the product may vary according to the surroun ding environment, the environment inside the vehicle and the habits of the driver.

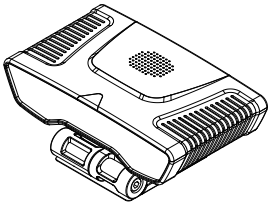
- Abide by the user manual for installation and usage of the product.

- Illustration provided in this manual may vary in color from the actual product depending on the quality of the printout.

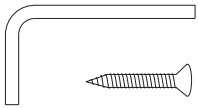
- The product and its user manual may be revised without prior notice fo improved features.

- Always use the accessories officially provided by the company with the product. (Using accessories or cables unauthorized by the company on the product may cause an explosion.)

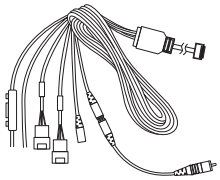
3. Components



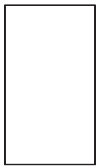
Main body
(holding dock, with the double-sided tape attached)



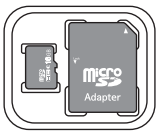
Allen wrench to adjust the angle of the holding dock, bolt to attach to the vehicle (X4)



Power cable
for multi-connections



User manual



Micro SD Card
(including adapter, option)

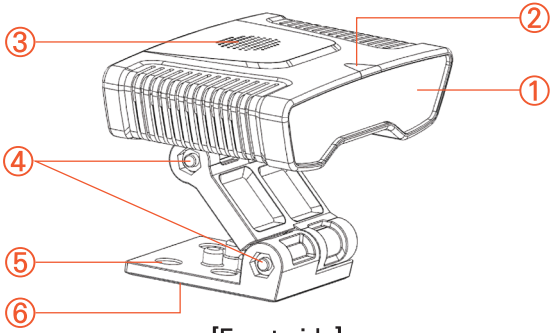
GPS module
(sold separately)

Vibration cushion
(including a dedicated cable)
(sold separately)

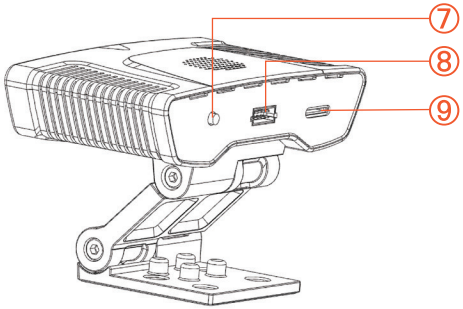
※ Please check that there are no missing components.

※ Components may be changed without prior notice for improved quality or features of the product.

4. Part of the product



[Front side]



[Back side]

숫자	Labeling
①	Sensor camera
②	Status LED (RGB)
③	Speaker hole
④	Bolt to adjust and fix the angle
⑤	Screw hole to attach and fix to the vehicle
⑥	Double-sided tape
⑦	Switch to adjust volume-sensitivity
⑧	Multi-connection cable
⑨	Micro SD card slot

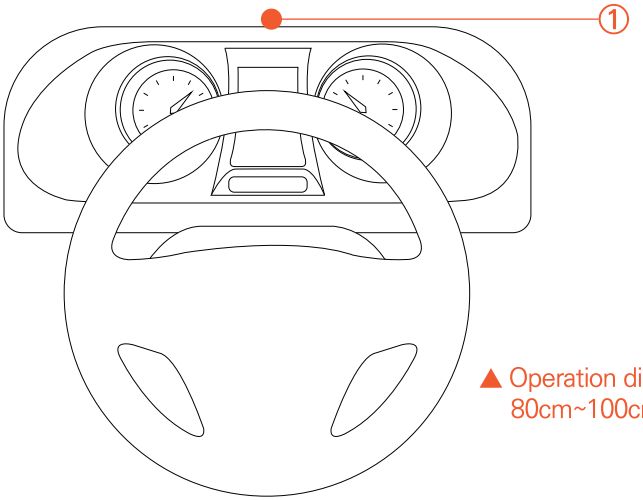
5. Location of product installation

Caution required when installing the product

- If possible, install the product while on a flat surface. Make sure the engine of the vehicle is turned off during installation.
- Make sure the product is not installed in a location that blocks the view of the driver.
- Install the product away from a location where the air bag is installed.
- Make sure the movement of the steering wheel is not obstructed by the product installed.

Selection of the installation location

- Select the location of installation by referencing the image below.
- Install the product slightly lower than the point where the gaze of the driver lands when facing forward.



▲ Operation distance
80cm~100cm

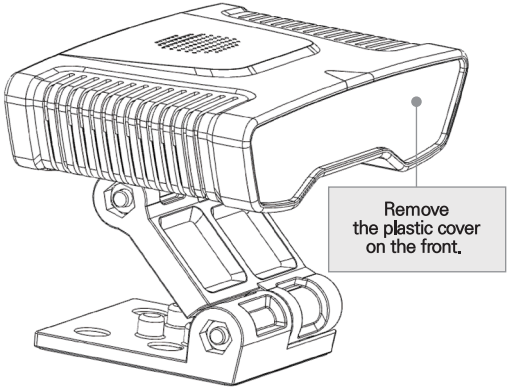
No.	Recommended location
①	On top of the dashboard (recommended)

※ Depending on vehicle specification, the mounting position may vary.

6. How to install the product (holding dock)

How to install the product

- Remove the front plastic cover.
- Remove any foreign materials from the surface of the selected location.
- Use the double-sided tape on the bottom of the holding dock to attach it to the location where you wish to install the product. Make sure the tape is attached firmly. (The product may move with long-term use of the pro duct or the vibration coming from the vehicle. In such a case, the detec tion of movement may be undermined.)
- For firm attachment of the product, use the bolt to attach the product onto the chosen location such as the dashboard of the vehicle.
- Adjust the camera lens so that it faces the eyes.
- Once the adjustment of location is complete, use the allen wrench to fasten the bolt for angle adjustment.
- Connect the multi-connection power cable and GPS.

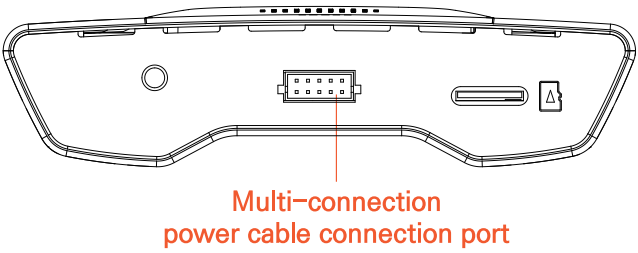


Main body and holding dock

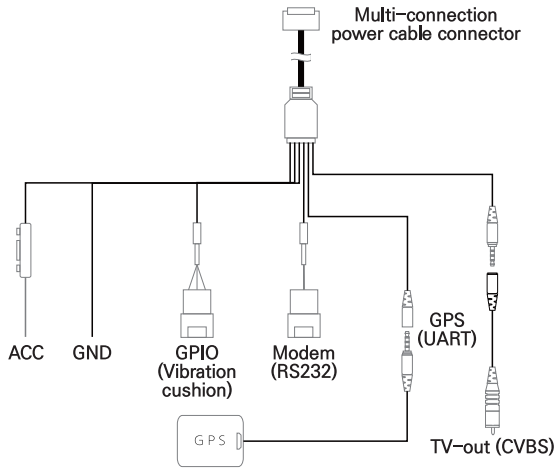
6. How to install the product (multi-connection power cable)

How to connect the product

- Connect the multi-connection power cable to the main body of the product.
- Connect the ACC/ GND power cable to the fuse power outlet of the vehicle.
- Connect to GPS.
- For details concerning the cable, refer to the following image.



Back of the main body



Multi-connection power cable

7. About the product and product's features

About the product

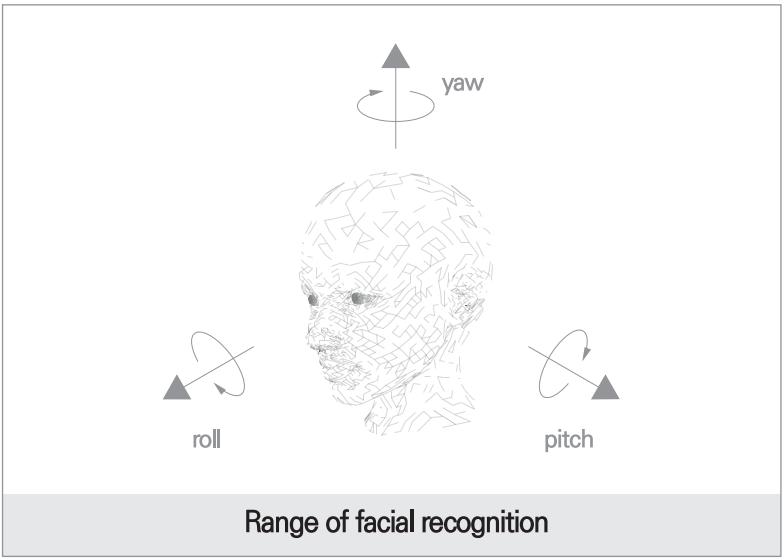
- High-functioning ARM CPU
- CMOS image sensor
- RS-232 / UART interface
- Circuits to protect from overvoltage/ overcurrent/ reverse voltage and minimization of noise
- Algorithm for tracking and detection of the face and pupils
- Acquisition of KC certification and application of RoHS

Main features

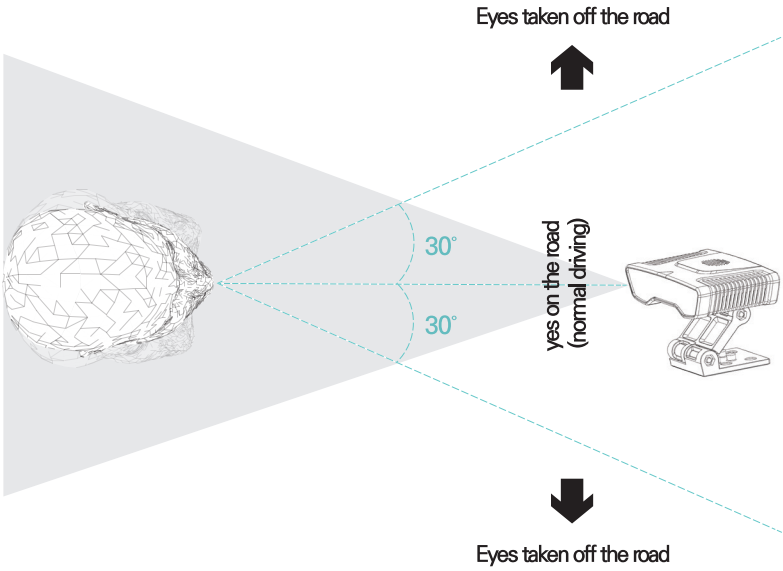
- Detection and warnings issued when the driver shows drowsiness / takes his eyes off the road/ smokes/ makes a phone call
- An infrared ray LED is applied to allow for detection during night time and in dark places such as inside a tunnel
- A special filter is built in to remove scattered reflection caused by sun light.
- Glasses or sunglasses are detected. (However, some sunglasses might not be detected.)
- A three-color LED is applied to display the operation status (green/ blue/ red)
- Micro speaker is applied to issue warnings
- Compatible with all automobile models (DC 12/24V)
- A dedicated holding dock makes it easy to install
- Sound volume can be muted or adjusted in four levels.
- Sensitivity can be adjusted in three levels.
- Compatible with the vibration cushion that is sold separately.
- Firmware can be updated through the SD card.
- All events, such as drowsiness, eyes taken off the road etc. can be saved on SD card.

8. Description of product functions (1)

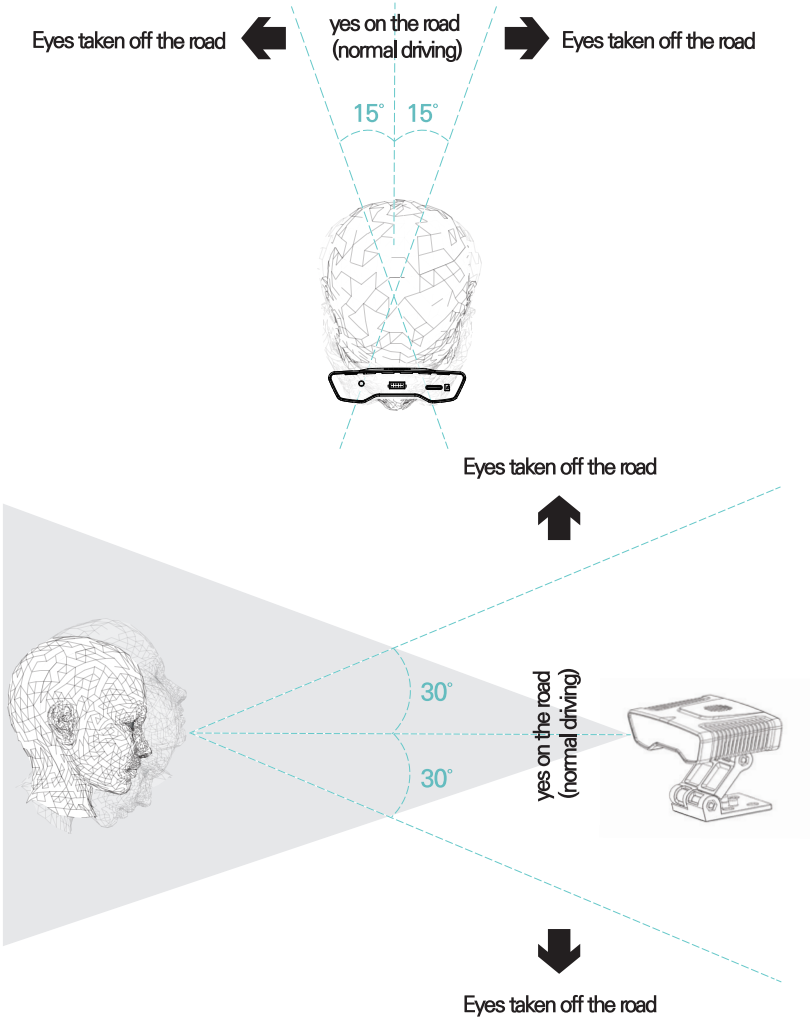
Range of facial recognition



Range of facial recognition



8. Description of product functions (1)



- Depending on where the product is installed, it may not operate properly.
- If the driver is wearing sunglasses or regular glasses that have special coating on the lens, detection may be undermined.
- If there are hair strands that block the eyes, detection may be undermined. If it is before or after sunset/ sunrise, and depending on the light coming from the sides or outside, detection rate may vary.
- A warning may be issued if the camera deems the driver's eyes to be closed. (E.g. if the gaze is downward, if the eyes are squinted or if the eyes become smaller due to laughing.)

8. Description of product functions (2)

The order in which the product should be operated and summary of functions

Operational status	Content	LED display	Warning alarm
1. Power on / booting	Reset and booting after connecting to a power source	R▶G▶B are displayed in order, after which G is switched off.	parapara pam
2. Status of the front side	The face is recognized as heading the front when it is within a range of 30 degrees to the top, bottom, left and right.	Once recognized, the green LED lights up.	-
3. Drowsiness #1	If both eyes are closed for one second or longer while facing the front, this is detected as a first sign of drowsiness.	The red LED lights up.	beep~
4. Drowsiness #2	If a state of drowsiness continues for an additional one second following the alarm sounded for 1st sign of drowsiness.	The red LED lights up.	Siren 1, Siren 2, Whistle (randomly played continuously.)
5. Detection of eyes taken off the road	If the eyes are at an angle of 30-60 degrees for 2.5 seconds or longer, it is deemed that eyes are off the road.	The red LED lights up.	Ding ding
6. Face has left the range of detection	When the face is not heading the front or within the range of 30-60 degrees	The red LED lights blinks (at an interval of 2 seconds.)	Ding ding
7. Smoking	If smoking gestures are continued for 0.5 seconds or longer while the face is headed towards the front.	-	Beep beep beep
8. Use of mobile phone	If gestures of phone calls continue for 5 seconds or longer while the phone is held and the face is headed towards the front.	-	Beep beep beep
9. Power off	The power cable has disconnected or the car's engine has been turned off.	-	-

※ The LED and/or warning alarm may vary according to the version of the firmware provided.

8. Description of product functions (3)

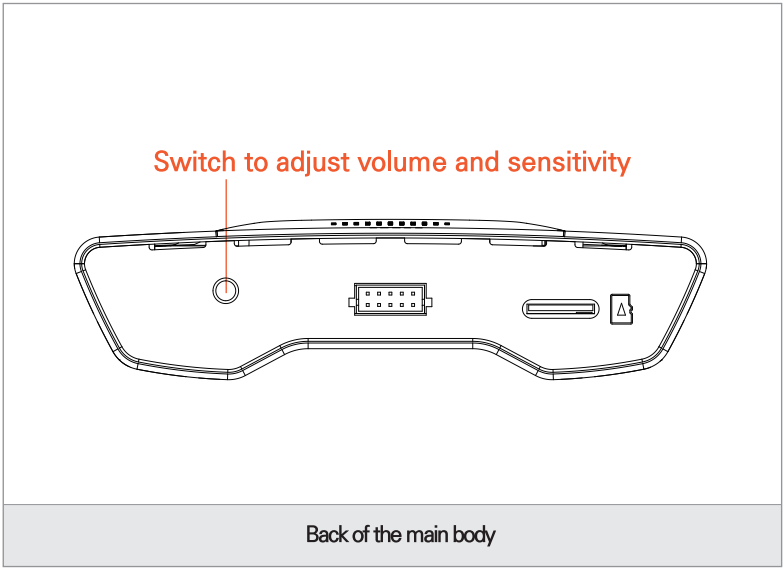
About the buttons and GPS-related features

■ Switch to adjust volume/ sensitivity

- Volume can be adjusted by pressing the switch for a short duration (Sound can be muted or adjusted to levels 1 to 4).
- Sensitivity can be adjusted by pressing the switch for a longer duration (Level 1(low) / Level 2(standard) / Level 3(high). Default setting is Level 2.)

■ Alarm features

- GPS data are received. When the car is not in motion (0Km/h), some alarms are not sounded.
- When the operation switch is set to mute, no alarms are sounded. However, LED will still operate.
- In areas where GPS signals are not received, no speed can be picked up, resulting in the alarms not being sounded.
- Using the product while connected to GPS is recommended to make the most of the product's features. (When the GPS is not connected, the use of some functions may be restricted and a warning sound may be generated even when stopped.)



Back of the main body

9. How to diagnose defects

Symptom	Measures to be taken
The LED that shows the operational status does not light up or does not change color.	If the LED that shows the operational status does not light up after connecting to a power source, please contact our after-sales services team.
	This indicates that after being connected to power, the LED continues to blink in red and the camera is unable to identify the eyes. Adjust the installation location. If there are still no changes, please contact our after-sales services team.
	If the LED that shows the operational status is erratic, check again whether the product has been installed properly. If there are still no changes, please contact our after-sales services team.
I cannot hear the warning sound from the speaker.	Press the switch for volume adjustment on the back of the product to check that the sound has not been muted. If there are still no changes, please contact our after-sales services team.

10. Product specifications

Category	Detailst	
Dimensions (W x D X H / excluding the holding dock)	111.3 x 67.1 x 43.2mm	
Weight	133g	
Color	Black	
Alarm	Speaker	O
	LED	Red (R), Green (G), Blue (B)
Storage device (firmware update / events saving)	Micro SD Card(Option)	
Input voltage	12/24V	
Items detected	Drowsiness 1,2 / Eyes taken off the road / Face out of range / Smoking / Calls on the mobile phone	
Recognition distance (Camera <-> driver)	80 ~ 100cm	
Installation location	Installation according to the specifications of the dashboard and vehicle	
Temperature range for product operation	-20 ~ +60℃	
Power consumption	5W	