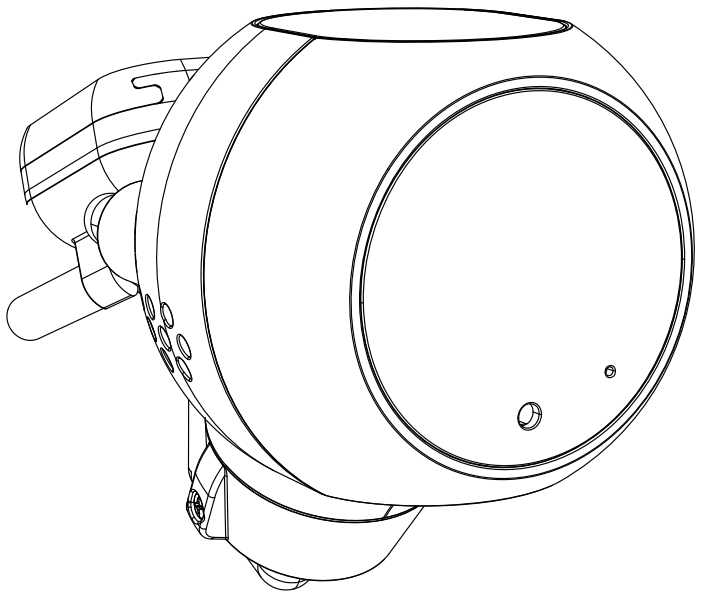
MDSM-22

User Manual



MOVON CORPORATION

※ Thank you for purchasing MOVON Driver Status Monitoring System.

Please read the manual carefully before using MDSM-22.

- ***Any inappropriate*** or ***illegal activities or violation of traffic rules on the roads are driver's responsibility.*** MOVON Corporation will not compensate any damage nor accept responsibility related to behaviors mentioned.
- Please be aware of MOVON's policy that private information and traffic related laws are user's responsibility. ***MDSM-22 only gives warnings to drivers. The final decision to maneuver / control shall be made by drivers themselves.***
- The safety function performance might be affected by driver status, road environments, weather conditions and installations.
- Customer service incurred by controlling while driving or damaging / revamping will not be guaranteed by MOVON's policy.
- MOVON shall NOT be responsible for any problems and/or damages that may occur from not using genuine or MOVON authorized parts and accessories. It is strongly recommended to use parts and accessories (including micro SD card) provided by MOVON or MOVON authorized seller to avoid any problems and/or damages.
- The information may not be up-to-date on the user manual for upgrading or editing purposes. The manual can be modified at any time without notification in order to enhance software.
- The product software may be modified for better performance without informing in advance. Please refer to the **http://www.movon.co.kr** for latest information.

Warnings / Cautions : Violating the following precautions may result in personal injury, death, or property damage.

- Do not install in disregard of installation instruction. It is recommended to go to authorized workshop.
- Do not use damaged/modified cables or voltage out of the rated voltage.
  It may cause injury, death or property damage.
- Do not modify nor disassemble the product and cables. It can cause explosion or fire resulted in injury or property damages.
- Do not use chemical on the device. It can cause fire or electric short, or malfunction of the device.
- Do not attach MDSM-22 in which it can obstruct the driver's view.
- Do not operate while driving, it is prohibited by law. If necessary, operate after stopping at a secure area.
  Do not apply excessive force when pushing the buttons on the device.
  Do not leave the product where infants, children or pets can reach it.
- Operating temperature is -4℉ ~ 158℉(-20℃ ~ 70℃).
  MDSM-22 may not operate properly and be damaged in excess of the temperature.
- The functions may not work properly due to camera location and angle, and weather conditions.
- Recorded videos are only for personal use purpose. The video quality is not guaranteed to prove specific images.
- If the product is damaged or the power supply is cut due to an accident, video may not be recorded.
- Foreign substance or finger print on the lens may cause improper safety function performance.
  If recorded videos are broken due to users mishandling, the damaged video is not guaranteed to recover.
- Do not separate micro SD card from MDSM-22 while the power is on. Separate after turning off MDSM-22 if necessary.

1. Product Overview

1.1 Main Features

MOVON Driver Safety and Monitoring (MDSM) helps drive safely by using a machine vision recognition technology to prevent drowsy or reckless driving

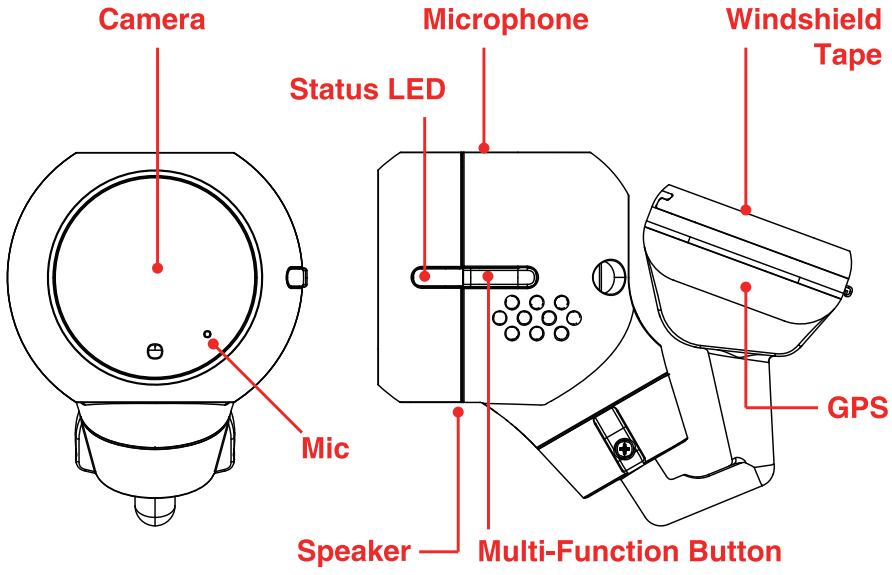
[Main functions]

	**Drowsiness** Provides alarms when the driver's eyes are closed.
	**Distraction** Provides alarms when the driver looks away.
	**Yawning** Detects when the driver yawns. Provides alarms when the driver yawns twice within 1 minute.
	**Phone use** Detects when the driver uses mobile phone. Provides alarms every 30 seconds.
	**Smoking** Provides alarms when the driver smokes.
	**Seat-belt** Detect when a driver is not fastening the seat-belt over 10kmh
	**Driver ID detection** Stores (maximum) 200 driver IDs and identifies which driver is on board.
	**Recording** Supports 3 different recording modes: Normal / G-sensor event / DSM event. Transmits real-time video via Ethernet (ONVIF) or stores in SD card (Maximum 128G).
	**ADAS (Optional)** ADAS camera can be integrated with MDSM-22 through ethernet interface. MDSM-22 is getting event videos and data of ADAS device and then transmitting out snapshot/data via RS232 interface.
	**Smartphone APP.** Plays videos of MDSM-22 on Smartphone APP through Wi-Fi connection

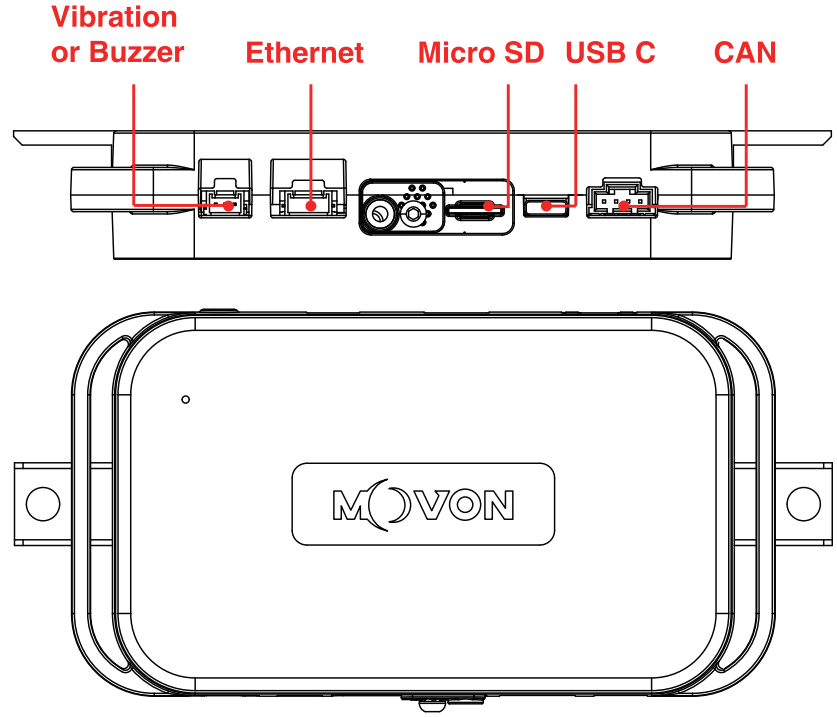
1. About Product

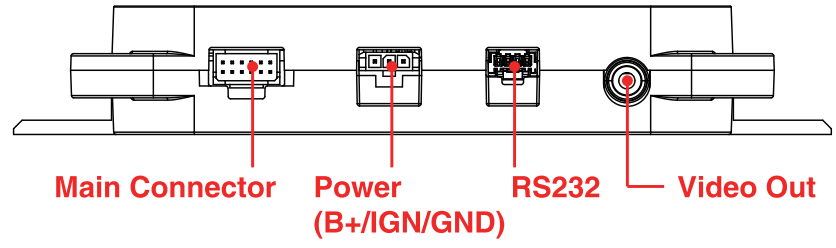
1.2 Parts Description

Camera



Main Control Box





2. Installation

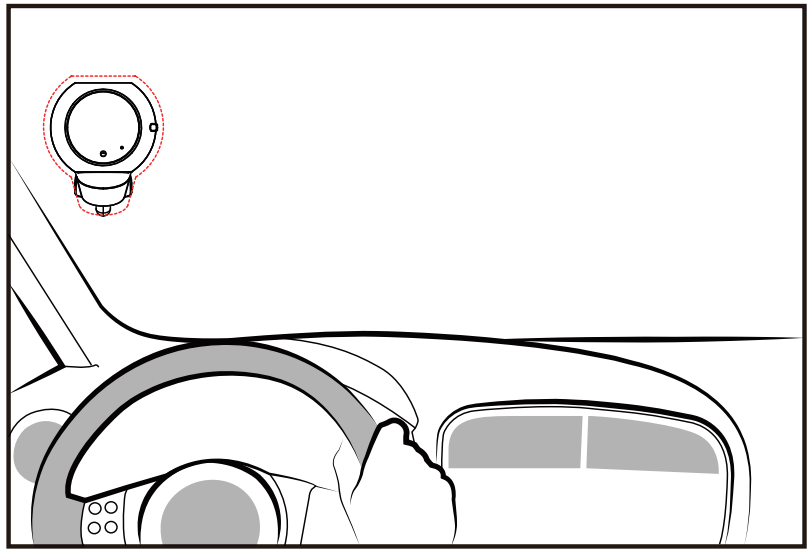
2.1 Installation Position for DSM camera

- Location: DSM camera is recommended to be attached next to A-Pillar
- Angle: below the driver's eyes is recommended, about 1° - 20°.
- Detecting Range: 80 – 100cm from the driver's face is recommended.
- The installation location and angle are very important to MDSM-22's performance. For the best, instructions above is highly recommended.

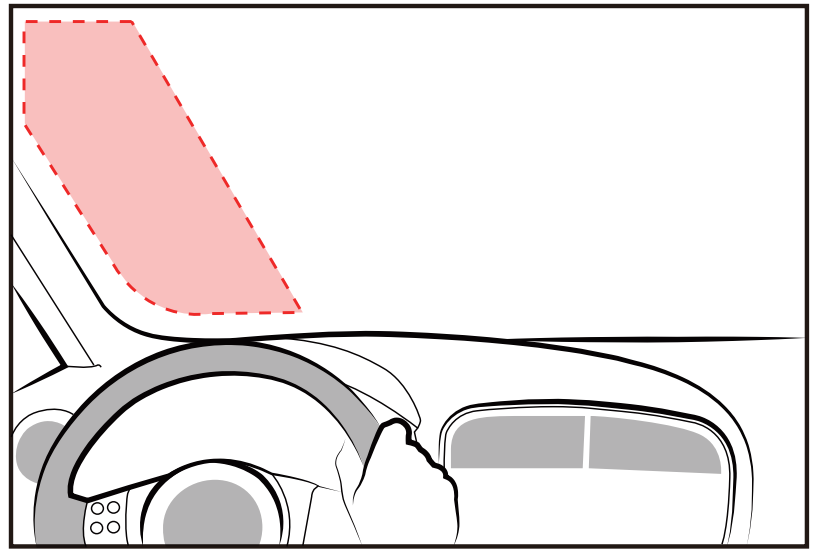
2.2 Installation Position for Control Box

- The control box is put inside the dashboard.

Recommended Installation Position



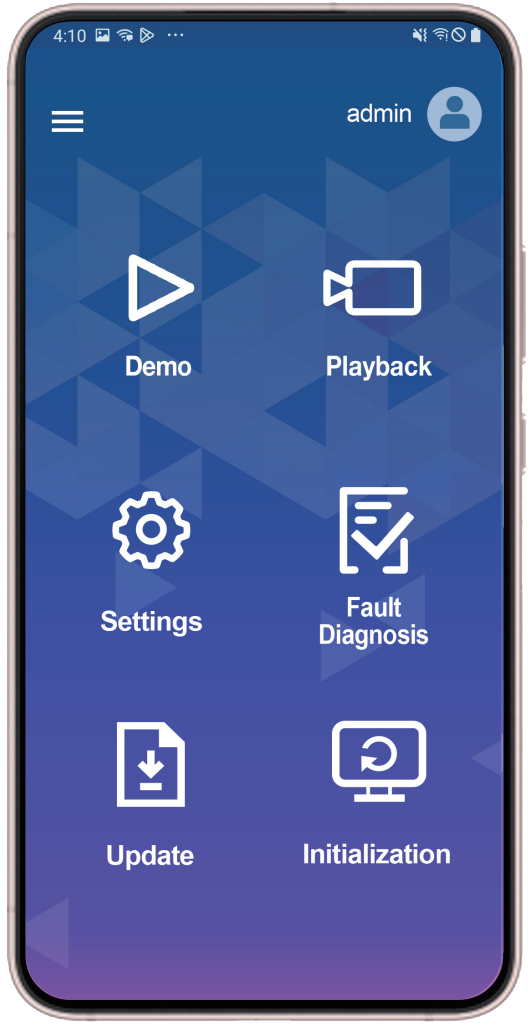
DSM Camera installed next to A-Pillar



3. Calibration

3.1 Calibration on Smartphone APP.

- Please do calibration on Smartphone APP. And, the APP. provides other functions as follows.
  - Firmware update mode through Wi-Fi connection
  - Video download and Play mode
  - Demonstration mode
  - Diagnostic Mode



- **How to activate Wi-Fi Mode**
  1. Wi-Fi is available for 5 minutes after MDSM-22 is turned on.
  2. Press the button on side of the camera for 5 seconds to activate Wi-Fi for 5 minutes.
  * If it cannot connect to the Wi-Fi, please reboot the device and try again.

3.1 LED Status

1) Orange : Indicates that the MDSM-22 is in normal operation during boot or after boot is completed when it's below vehicle activation speed.

2) Green : Indicates that the MDSM-22 is in normal operation that may cause an audible warning at or above the vehicle activation speed.

3) Red
(1) Calibration Mode : Red LED blinks with tic sound.
(2) Error indication : If there is an issue with the camera or SD card, it indicates that the MDSM-22 has an error. More details on the error can be found in the Calibration Diagnostic Mode.

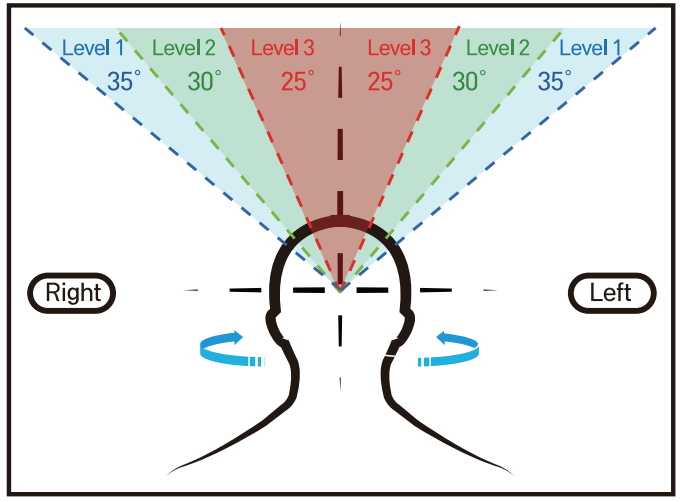
4. Settings

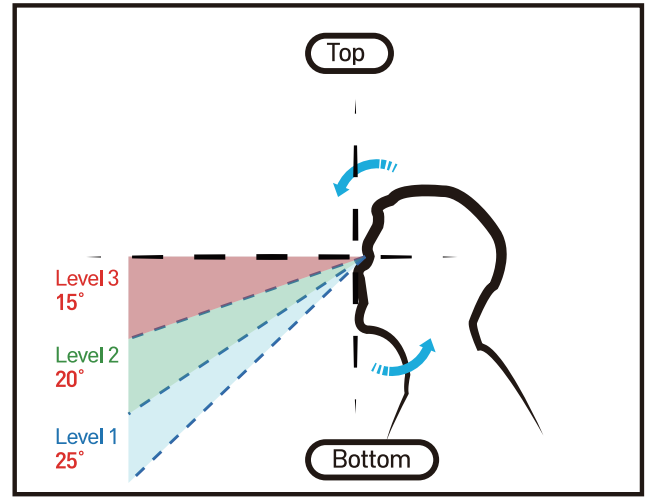
4.1 DSM Warning Settings

* Each warning condition depends on sensitivity level settings (Level 1-3).
* The vehicle speed must be faster than the activation speed to activate the warnings.
* All the alerts repeat until the Event releases.
* A yawning alert will initiate in 2 seconds. (Default setting)

Features	Warning conditions	Level (Seconds)		
		3	2	1
Drowsiness	When the driver closes eyes for certain period	2	3	4
Distraction	When the driver looks outside of warning range below	3	4	5
Yawning	When the driver yawns for 3 seconds twice within 1 minute	-		
Phone use	When the driver talks over the phone for certain period (Every 30 seconds)	2	3	4
Smoking	When the driver smokes for certain period	2	3	4
Seat Belt	When the driver doesn't fasten the seat belt over 10kmh	15		

Distraction Warning Range





4. Settings

4.2 Recording Settings

* Recording modes

Mode	Trigger	File name	Folder
Normal	1 minute in a loop	Date_Time_NOR (20220601_063903_NOR)	NOR
G-sensor	G-sensor event	Date_Time_EVT (20220601_063903_EVT)	EVT
DSM	DSM event	Date_Time_DSM event type (20220601_063903_PHO)	DSM

* Recording hours

SD Card Storage	Maximum recording hours (Normal mode)	
	DSM Camera (40M per 1Min.)	2CH (DSM + 2nd Camera)
32G	Approx. 12 hours	Approx. 6 hours
64G	Approx. 24 hours	Approx. 12 hours
128G	Approx. 36 hours	Approx. 24 hours

Caution & Note:

- Depending on your environment, actual recording duration and Micro SD card lifespan may vary.
- For stable performance, it is recommended to format the Micro SD card every 2-3 weeks.
- Formatting will delete all data in Micro SD card. If you want to keep the data, please back up in advance.
- If MDSM fails to format the Micro SD card more than twice, please try with PC.
- When you remove the Micro SD card, please make sure MDSM is completely off.
- A Micro SD card is a consumable accessory. MOVON does not guarantee the life of user's Micro SD card. It is recommended to check the status of Micro SD card on a regular basis and if Micro SD card is not working properly, please contact the seller and purchase a new Micro SD card.

5. Limitations & Limited Warranty

5.1 Limitations

MDSM-22 doesn't guarantee 100% accuracy in detecting driver status or providing warnings for all potential accident causes behind the wheel.

MDSM-22 doesn't give alerts until it recognizes the driver's face. If the driver closes eyes or opens them little on purpose during face detection process, it will trigger false alerts while driving. Depending on the driver's facial characteristics, MDSM-22 may not detect/recognize the driver properly.

Direct sunlight to the camera lens or the driver's face can adversely affect MDSM-22's recognition performance. In case of partial or full blockage of the vision sensor, its ability to detect may be limited or MDSM-22 may not work properly.

The glasses or sunglasses could reflect the sunlight or surroundings. This will prevent MDSM-22 from detecting eyes and lower MDSM-22's performance accuracy. Also, any object that covers the driver's face, such as a eyepatch, hat, cap, mask, muffler, or other items could affect the performance as well.

The dirt, scratch, or a fingerprint on the camera part can affect recognition performance. Do not touch this part with bare hands or anything sharp. If there is dirt or fingerprint, wipe it up gently with soft and dry cloths.

5. Limitations & Limited Warranty

5.2 Limited Warranty

The term of this product warranty is 1 year from the purchase date.

Meanwhile, the warranty period of the micro SD card, which Movon sells, is 3 months from the purchase date.

This MDSM-22's Limited Warranty is non-assignable and covers the original purchaser of the MDSM-22 installed on the vehicle for which the MDSM-22 was purchased against defects in material or workmanship for a period of one year from the date of purchase.

The sole obligation of MOVON under this Limited Warranty is to repair or replace, at MOVON's discretion, any MDSM product that is determined by MOVON to have been defective in materials or workmanship. MOVON will not be responsible for conditions arising as a result of installation.

The following are excluded from warranty coverage: (a) Damage from misuse, negligence, improper installation or accident, (b) Installation on a vehicle other than the vehicle for which this MDSM product was designed, (c) Repair or alteration of this MDSM product by any party other than MOVON.



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