

# Driver Fatigue Monitor

## MR688B User Guide

(MR688B-RS232)



## Product Composition

### Appearance & Display



### Constituent Elements



\*MR688B includes the host and 4 pin signal cable. It can work on all types of vehicle, both 12V and 24V power supply.

## Caution

- ✧ Do not attempt to disassemble or alter any part of the equipment if you are not authorized maintenance personnel.
- ✧ Do not operate the product, during driving, in order to ensure safe driving.
- ✧ Please handle carefully, avoid dropping or subjecting the product to severe impacts.
- ✧ Do not clean or maintain the equipment with chemical solvent or thinner, it may cause damage to the surface.
- ✧ Do not allow the product to come into contact with, or become immersed in water or other liquids. Do not store the product in humid or dusty areas.
- ✧ Do not heavily drag and kink the cable, do not place heavy object on the cable, otherwise, it may cause heating and fire.
- ✧ Special legal statement: Driver fatigue monitor is only an alarming product, do not absolutely guarantee for your driving safety. Please be noted that MR688B is not responsible for any driving accident.
- ✧ While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions.

- ✧ We reserve the right to change the specifications of the hardware and software described herein at anytime without prior notice.

## Extra Attention

- ◆ MR688B does not recognize the people who have only one eye, white eyebrows, rough scars or wrinkles around eyebrows.
- ◆ The product's storage temperature is  $-45^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ .  
The normal working temperature in cab is  $-10^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ . If the cab temperature is below  $-10^{\circ}\text{C}$  in winter or above  $+50^{\circ}\text{C}$  in summer, the system will be in dormancy status automatically. When starting up the vehicle under dormancy status, the system will recover to the normal working temperature ( $-10^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ ) after several minutes, once the cab temperatures reaches the normal working temperature, it will start work automatically again. If the system has been working, it doesn't matter even if the temperature decreases or increases.

## Installation Method

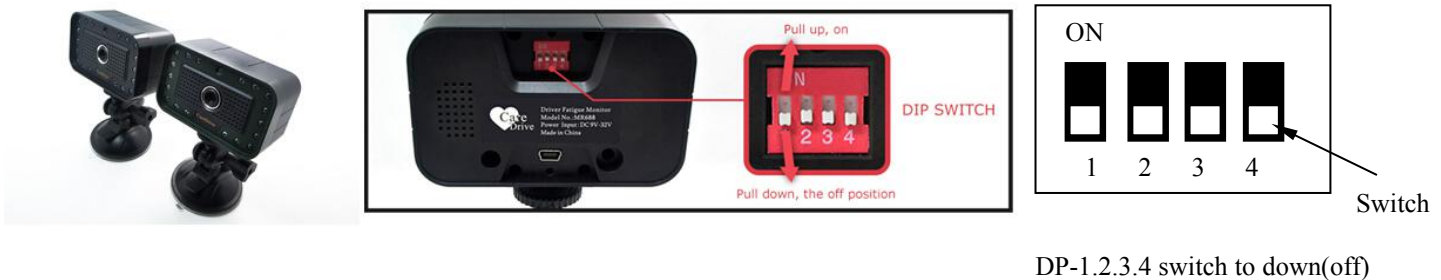
In case affect vehicle safety, the installation of the **RS232** version, please operate by professional technician.

1. Put 4 pin signal cable connect with power supply. (Please according to the part of **AVL system (GPS/MDVR) Connection**), connect the 4 pin cable of host with 4 pin extension signal cable.
2. The step to install the device on the dashboard is just similar. Install the device on the dashboard **left/right/in front** of the driver. The degree between the **lens** and the driver's **eyes** should be within 20 degree. MR688B can be fixed on uneven surface as long as the camera is trained on the driver's face.
3. Tear the protective film from suction cup of bracket, put the host on the holder (If choose simple sticker bracket, please omit this step) Tear red sticker of holder's bottom, put the host on optimal position of dashboard lightly. Train the lens on your face and adjust the position of the lens according to the state of the green light.
4. The host connected with bracket, the lens must be installed vertical. Bracket can be adjusting the height from screw on the right side. Bracket has two universal balls, customers can adjust different direction. The lens must be installed vertically. That means the green light and the center of the lens remain in the vertical. Don't press the double-sided adhesive tape too firm at first, so the inappropriate position can be re-adjusted easily.
5. To test the right installation, sit in the normal position in the car, if the green light of the camera light up is bright or flashing, indicating that the driver has been detected in opening the eyes. The distance from lens to the driver's eyes should be between 60cm-**100cm**. when the driver are looking at the front and the green light remain bright, indicating that MR688B can detect the driver's eyes better. Adjust the correct position of the camera where the green light can keep on as far as possible. Flashing green light is normal while driver open the eyes, especially for the driver wearing rimmed spectacles.
6. The dashboard of truck and bus is low, try to install at higher position before the driver. If you install the device in the side front of the driver, the angle should be not more than 15 degree, the host should not be higher than the driver's eyes and the angle between the installation location and the driver's eyes should not more than 30 degree.
7. The distance from lens to the driver's eyes should be between 60cm-100cm.
8. Sit in the normal driving position. If the green light is on or twinkling, indicating that the driver has been detected in opening the eyes. If the green light is still on or flashing when the driver moves a little distance from left to right and down to up, indicating that the installation location

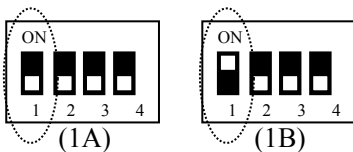
is more reasonable. Then you can rest assured a safe driving. Flashing Green light is normal while driver open the eyes, especially for the driver wearing rimmed spectacles. If there is some shielding, the green light will be flashing.

## Sensitivity Setting

Because of the different understanding to the product, peoples' initial expect of purchasing is to hope the product can be alarmed once their eyes closes. In fact, this may cause some non-sleeping warning, they may complain too much warning after using several time and prefer to make alarm only for real sleepy condition. So we set up 2 levels sensitivity to help customers adjusting conveniently when they use the product. Each level it can quickly detect the real sleepy or absentminded condition, only the alarming time is different for looking around and normal eyes closing.



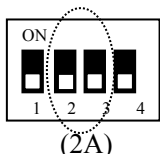
Please see above pictures, the toggle switch located at the back side of the product, it will be pushed to the OFF position before delivery.



1A: DIP1=OFF(pull down), for testing sensitivity( high sensitivity, for test use)

1B: DIP1 =ON (pull up), for normal sensitivity. It takes a little bit more time to make alarming for driver's drowsiness or looking around.

## Fatigue Alarming Speed Setting



DIP2 and DIP3 switches, for fatigue alarming **start up** speed setting (when vehicle speed is lower than warning **start up** speed, no alarm; when parking, reversing, low speed inspecting etc, automatic no alarm.)

DIP2=OFF (down), DIP3=OFF (down), any speed will alarm.

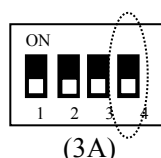
DIP2=OFF (down), DIP3=ON (up), alarm when more than 20KM/H.

DIP2=ON (up), DIP3=OFF (down), alarm when more than 30KM/H.

DIP2=ON (up), DIP3=ON (up), alarm when more than 45KM/H.

## Volume Adjustment

Everyone has the different requirements about the alarm volume. The volume can be set by adjusting the Switches (DIP-4).



3A: DIP4=OFF (down), high volume.

DIP4=ON (up), low volume.

## Power Supply

- MR688B power input is 9V-32V, it works with both DC12V and 24V power, fit for the gas car and diesel vehicle. It has good peak-voltage protection measures.
- Driver Fatigue Monitor System is with low power consumption, in the 12V cases, the average current is less than 340mA, while in the 24V, the average current is about 180mA.

## AVL System (GPS/MDVR) Connection - Alarm Signal Interface

Lead's color	Pin number	Definition of signal
Red	pin-1	Power+, DC12V/DC24V
Black	pin-2	Power-, GND
Blue	pin-3	MR688 232 data receiver (Rxd), MR688 <- Host
Green	Pin-4	MR688 232 data transmission (Txd), MR688-> host

**Note: Do not touch the power+ to the output signal lines. Because it will damage the MR688B.**

### RS232 is used for:

For vehicle management system (AVL system), vehicle operating records systems. AVL required by the **MR688B RS232** communication protocol to communicate with the **MR688B**.

The Systems receives the **MR688B** signal, can real-time send to the management center; can record the signal by on-board equipment. Calculate the number of alarm and the time of alarm, and then managers can understand the driver's normal driving condition. For the driver who is often in poor state, it can strengthen management by this system and prevent fatal accidents.

### Signal matching:

AVL must have a spare RS232 communication port. And AVL can program it according to **MR688B RS232** communication protocol.

## About the Power

- **During demonstration or testing, MR688B sometimes not alarm, Power may cause it.**
- MR688B is an electronic device with a high-speed image processing CPU, it is designed to use the vehicle power supply. Vehicle power supply is the linear power with battery. When Demonstration and testing, customers should use the DC linear regulated power supply and power supply should be grounded.
- **Demonstration and testing, do not use switching power supply.**  
Because switching power supply has much high-frequency interference, need a good filtering and shielding. In the market, a lot of Switching power supply filtering and shielding is not enough, even not to ground, can easily cause interference to make MR688B not working properly. It is not easy to test whether the quality of switching power supply is good enough. So we do not recommend switching power supply.
- During Testing and demonstration, please use the DC Linear Power Supply, and the power should be grounded. We recommend the adjustable DC linear regulated power supply for electronic maintenance. This power can guarantee quality of supply. Connect MR688B

cigarette power adapter to the power output cigarette lighter socket.

- If you use the power cable to directly connect MR688B. **Must pay attention: Use the power cable with a round needle-shaped plug . Do not misuse the alarm signal output cable.**

**Wrong connection will cause MR688B damage.**

- If you use a switching power supply, will not damage MR688B, but may be no alarm sometimes. If have this problem, please turn off MR688B power and restart.

## User Note

### Alert Status

Usually people enter the Alert Status after 1 minute normal driving, but some people who wear glasses need take at most 5 minutes. If you are in real sleep after the system enters to the Alert Status, MR688B will start warning. It is smart, before you close the eyes, if you have some big movements or long talking, without any fatigue condition, it only gives you one or two friendly reminding alarm after your eyes close for 1-2 seconds, it may not remind if the movement is too big. If the driver didn't have big movement and didn't speak, eyes open gets smaller and smaller, or eyes closed, or watching the front but in thinking, it will make sharp alarming after 3 seconds.

After the product is connected to power supply for 2 seconds, the green light will flash for 1 second. If it is at night, the infrared light will get red. In the first 30 seconds, the system detect the driver's position and analyzes driver's condition, it does not make warnings during this period. Only after the driver has been keeping driving for more than 30 seconds, the system will enter into alert status. However, once power is on, the system will detect if the driver's eyes are open or not. If the green light is on, it means the driver's eyes are open. If the green light is off, it means the driver closes eyes or driver is not in the detecting range of the camera. For the first time installation, you can adjust the camera's position based on the green light's display.

MR688B can detect and analyze the driver's fatigue condition prior to falling into sleep. Normally, driver's eyes get less and less sensitive to the light before falling into sleepy condition. At this time, this smart MR688B is keeping detecting and analyzing the driver's retina condition, make sharp alarming to awake the driver prior to fall into sleep. Driver should stop driving immediately and have a rest after reminded by MR688B.

### People Image Identification

For special populations, such as people with thin eyebrows or with no eyebrows, the system need 1-60 seconds to detect, if the green light turns on when open eyes and green light turns off when close eyes, it means the identification is successful.

The product may not be able to identify some old age people (above 60 years old) and young age people (below 15 years old), also can't identify people who have only one eye (the system is designed based on two eyes). Old people can be detected if they are in good body condition, big scar around the eyes cannot be identified as well.

For some rare people, if can't be identified by the system after 1 minute, we suggest not use this product. If they still hope to buy it, they can provide the front face photos to us. We can make special one for them, but need additional cost and time.

### Wear Glasses or Sunglasses or Contact lens



For drivers who wear glasses or sunglasses or Contact lens, the system can also detect. If they wear the glasses with frame, in case the frame ward off driver's eyes, better to put the glasses a little bit more up on the nose, or install the host more lower (the position is lower if installing inside the dash board), we suggest to wear the glasses without frame.

For people who wear deep color sunglasses, they can install the host closer, we suggest wear bigger sunglasses.

For contact lens, without any affection.

## **Reasons of Non-alarming**

### **1. Inappropriate installation location**

A suitable location of the device should be this: when the driver looking ahead, the green light will light up or flash (if green light always keeps on, it is the very good position); when the driver close the eyes, the green light is off.

### **2. Unfinished face recognition**

After detecting the driver, MR688B will identify the face characteristics first, it doesn't start monitoring the fatigue until finishing the face identification, and the identification time is different for different drivers. Usually the device can enter the alert status after 1 minute's normal driving, it takes around 5 minutes at most to enter into alert status for some people wearing glasses. This won't affect the using as the driver won't get into sleep during the first several minutes' of driving.

### **3. Impact by the big movements**

MR688B is very intelligent. If the driver is detected a substantial movement in the early warning, it shows that there is no sign of driver's fatigue. In that case, MR688B only issue the friendly reminder after detecting the driver's fatigue state for 4-7 seconds.

### **4. Unstable power**

If you use another power supply for testing, the power supplies may be insufficient capacity, or the interference is too large. That will affect MR688B to work properly. Please use good quality power supply or the car power supply in the car for testing.