



***DRIVER FATIGUE
MONITORING SYSTEM***
RVS-350
User Manual



Product Composition

Appearance & Display



Constituent Elements



*RVS-350 includes the host and 5 pin signal line. 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 professional
- ◆ Do not adjust system while 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 damage 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/dusty areas.
- ◆ Do not heavily drag or kink the cable, do not place heavy object on the cable. This may cause a fire.
- ◆ Special legal statement: The RVS-350 is only a monitoring system, it alone does not guarantee safe driving. Please note that Rear View Safety is not responsible for any accidents.

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- ◆ While every effort has been made to ensure that the information contained in this guide is accurate and complete, we assume no liability 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.

Note

- ◆ The RVS-350 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°C ~ +85°**. The working temperature in cab is **-10°C ~ +50° C**. If the cab temperature is below **-10°C** or above **+50°C**, the system automatically become dormant. 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

Note: We recommend professional installation.

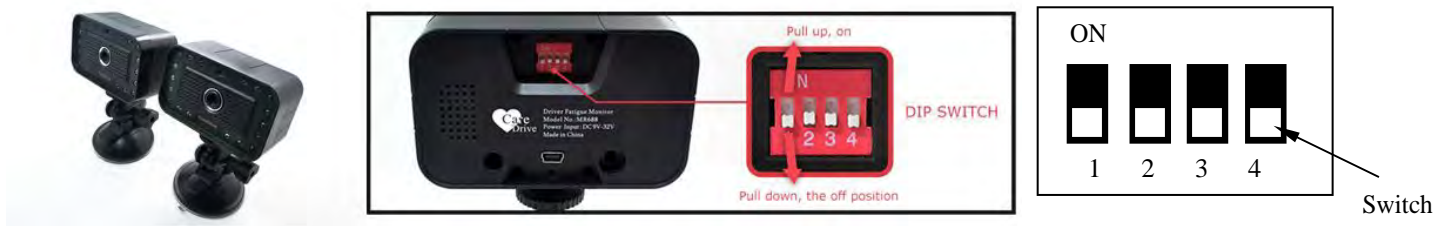
1. Connect 5 pin signal cable connect with power supply. Place according to the part of AVL System (GPS) Connection, connect the 5 pin cable of host with 5 pin signal cable.
2. Install the device on the dashboard directly in front of the driver. The degree between the installation location and the driver's normal driving position should be within 20°. The RVS-350 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. Train the lens on your face and adjust the position of the lens according to the state of the green light. Do not block the main display parameters of the instrument panel.
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 adjustable balls. The lens must be installed vertically. That means the green light and the center of the lens remain vertical. Don't press the double-sided adhesive tape too firm at first, so any inappropriate positioning can be easily re-adjusted.
5. To test installation, sit normally in the vehicle, if the green light of the camera is bright or flashing this indicates that the driver's eyes have been detected. The distance from lens to the driver's eyes should be between 60cm-90cm. When the driver are looking at the front and the green light stays bright, it is properly installed. Adjust the correct position of the camera so the green light can keep on as far as possible. A flashing green light is normal when the driver opens their eyes, especially for drivers wearing rimmed spectacles.
6. If the dashboard of truck and bus is low, install the RVS-350 at a higher position. 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 exceed 30°.
7. The distance from lens to the driver's eyes should be between 60cm-90cm. For some cases,

including under the strong light, or for drivers wearing glasses, the distance should be between 60cm-70cm. Usually the distance is between 70cm to 80cm.

8. Sit in the normal driving position. If the green light is on/blinking, this indicates that the driver has been detected. If the green light is still on or flashing when the driver moves from left/right and down/up, The system is properly installed.

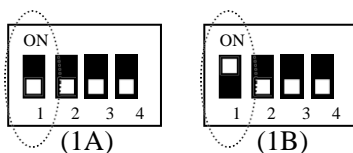
Sensitivity Setting

You can adjust the sensitivity of the RVS-350. Every setting will quickly detect a change in the driver's eyes, however the alarming time can be adjusted.



DP-1.2.3.4 switch to down(off)

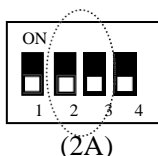
As shown above, the toggle switch located at the back side of the product, it will be placed in the off position upon system arrival.



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 alert driver when eyes move.

Fatigue Alarming Speed Setting



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

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

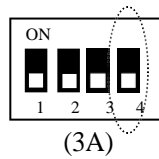
DIP2=OFF (down), DIP3=ON (up), alarm when more than 20KM/H.

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

The volume can be changed by adjusting the switches (DP-4).



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

DIP4=ON (up), low volume.

Notes:

After adjusting the DIP sensitivity switch, the settings will only take effect once the system is disconnected and re-connected. A change in the volume doesn't require the system to be disconnected to take affect.

RVS-350 Speed Alarm

1. When the speed is lower than the alarm, the RVS-330 does not alert the driver.
2. Speed detection is calculated by GPS signal. For initial setup, a GPS satellite signal search is required. This takes about 2 minutes.
3. When GPS signal is found, a voice prompt states 'GPS connection has been restored'. When there is no GPS signal (vehicle is in underground parking), a voice prompts states 'No GPS signal'.
4. When no GPS signal is detected (e.g. in underground parking), the speed alarm will not function.
5. On the back of RVS-350, DIP switch 2 and 3 are used to set alarm speed by hand. When the speed alarm is set with computer software this overrides settings on the physical device. The parameter can now only be changed with the software.

Power Supply

- ③ The RVS-350 power input range is 9V-32V. It works with both 12V and 24V power
- ③ Driver Fatigue Monitor System has a low power consumption. Using 12V, the average current is less than 100mA. Using 24V, the average current is about 60mA.

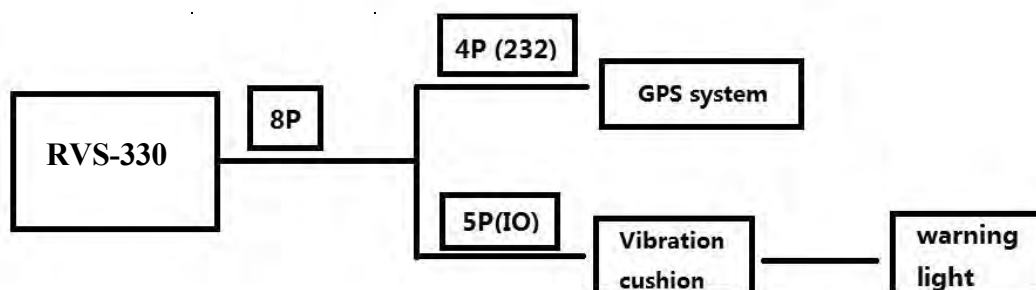
8P Cable Alarm Signal Interface

5P cable color	Pin number	Definition of signal
Red	pin-1	Power+, DC12V/DC24V
Black	pin-2	Power-, GND
Yellow	pin-3	Signal output of "fatigue warning" When fatigue detector alarming, output low level(0V); When alarm stopped, output high level(4.2V)
Blue	pin-4	Signal output of "no portrait warning" When portrait not detected, output low level(0V); When portrait detected, output high level(4.2V)
Green	pin-5	Signal input of "pause monitor" When input High-impedance, detecting and alarming normally; When input GND, suspending alarming (until the signal resume high impedance after 30s);

4P cable color	Pin number	Definition of signal
Red	pin-1	Power+, DC12V/DC24V
White	pin-2	Power-, GND
Grey	pin-3	RVS-330 Data Receiver (Rxd)
Brown	pin-4	RVS-330P Data Transmission (Txd)

Note: The RVS-330 can be connected to a warning light that alerts surrounding drivers to pay attention when the alarm is activated and a vibration cushion that vibrates whenever the driver fatigue alarm goes off. It can be connected to both of these accessories simultaneously.

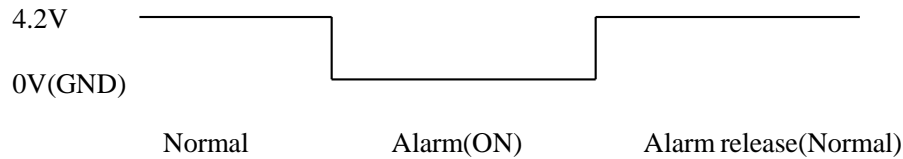
Cable Connection:



Note: Do not touch the power+ to the input and output signal lines. This will damage the system.

"Fatigue Warning" Signal Chart:

The ON(GND) signals detects driver fatigue.



- ③ The RVS-350 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.
- ③ 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 RVS-350 to cigarette power adapter to the power output cigarette lighter socket.
- ③ If you use the power cable to directly connect RVS-350. **Attention: Use the power cable with a round needle-shaped plug . Do not misuse the alarm signal output cable. Wrong connection will cause damage.**
- ③ If you use a switching power supply, it will not damage the system, but it may not work properly. If have this problem, please turn system 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 fall asleep after the system enters to the alert status, the RVS-350 alarm will be triggered. If there are large movements and the driver is talking before closing their eyes, it only gives them one or two friendly reminding alarm after your eyes close for 4-7 seconds. 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 2 seconds.

After the product is connected to power supply for 2 seconds, the green light will flash for 1 second. At night the infra-red light turns 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 first time installation, you can adjust the camera's position based on the green light's display.

The RVS-350 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, the RVS-350 is detects and analyzes the driver's retina condition, making sharp alarms to wake the driver up prior to them falling asleep. The driver should stop driving immediately and have a rest after being alerted by the RVS-350.

People Image Identification

For certain populations the system needs 1-60 seconds to detect, if the green light turns on when the eyes open and the green light turns off when the eyes are closed, it is working properly.

Glasses, Sunglasses, Contact Lens

The system will work for drivers who wear glasses, sunglasses, or contact lens. If they wear the glasses with a thick frame, it is better to place the glasses a little bit more up on the nose, or install the host lower (the position is lower if installing inside the dash board).

People who wear sunglasses should install the host closer, we suggest wearing large sunglasses.

The system works normally when driver is using contact lens.

Alarm Troubleshooting

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 closes their eyes, the green light turns off.

2. Unfinished face recognition

After detecting the driver, The RVS-350 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.

3. Previous alarm interval is too short

During normal driving, the driver will be alerted up by the alarm. The RVS-350 only alarms again after 10 seconds of the first alarm. So in the test, The RVS-350 will not alarm if you simulate the fatigue state too quick after the previous alarm.

4. Large movements

The RVS-350 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, the RVS-350 only issues the friendly reminder after detecting the driver's fatigue state for 4-7 seconds.

5. Unstable power

If you use another power supply for testing, the power supplies may be insufficient, or the interference is too large. This may cause the RVS-350 not to work properly. Please use a good quality power supply or the vehicle power supply for testing.



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