

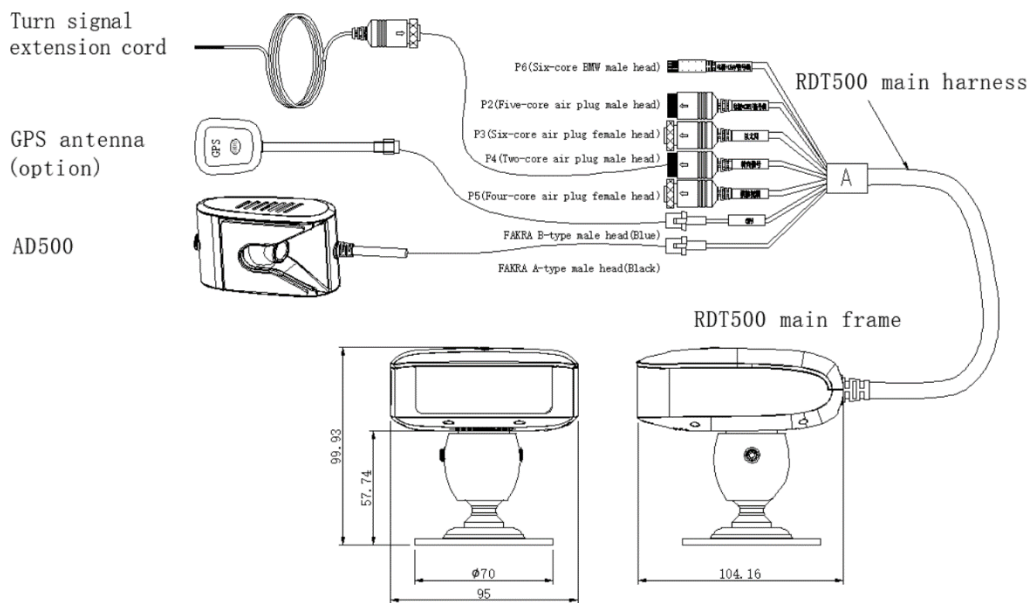
DT500B Active Safety Intelligent Control System User Manual

1 System Introduction

RDT500B is an active safety intelligent control system developed on the basis of the image recognition algorithm, which integrates driver status early-warning analysis and forward active safety warning with a main function of safety drive assistant, so as to avoid road accidents caused by poor driver status or improper operation. As split design is applied in the product, different camera solutions can be selected according to the vehicle_models. The product can communicate with the platform independently and can also be used with other on-board terminals through ethernet to provide a complete set of solutions for vehicle active safety control.

Fully considering the requirements of active safety terminals proposed by JT/T 883, JT/T 26773, JT/T 794, JT/T 1076, TJSATL13-2017 and other standards in designing the product has not only ensured the product conforming to the requirement, but also enhanced the stability, compatibility and maintainability of the system.

1.1 System diagram



	Product model	Product name	Note
System components	RDT500B	Active safety intelligent control system	
	RD-CAM-AD500	ADAS camera for road ahead	Bottom outlet
	RD-CAM-AD501	ADAS camera for road ahead	Top outlet

Note 1: Since RD-CAM-AD500 and RD-CAM-AD501 have different outlet modes, which can be selected according to different models and different installation methods.

1.2 Introduction of system components

1) RDT500B

Integrating the camera for analyzing driver status, RDT500B is acted as an operation processing center of the whole system to calculate the high-definition digital video information input by the forward road surveillance camera.



RDT500B appearance

2) RD-CAM-AD500 / RD-CAM-AD501

The RD-CAM-AD500 is an ADAS camera for road ahead, which is targeted road in front to monitor the road ahead. Video data obtained will be sent to RDT500B machine for analyzing and processing. With bottom outlet, it's generally applicable for large vehicles. While RD-CAM-AD501 is generally applicable for small passenger cars with top outlet.



RD-CAM-AD500



RD-CAM-AD501

2 Product list

Product list		
No.	Accessory name	Quantity
①	RDT500B active safety intelligent control host	1
②	Surveillance camera for road ahead RD-CAM-AD500, RD-CAM-AD501 (alternative)	1

Product list		
③	Stand	1
④	Screws for the stand	4
⑤	Allen wrench	1
⑥	RDT500B power supply and CAN extension cord	1
⑦	Instruction	1
⑧	RDT500B turn signal cord	1
⑨	GPS antenna (option)	1

3 Specification and Function

3.1 Active safety Function

Alarm type	Description	Voice prompt
Fatigue warning (level 1)	When the driver is found to be sleepy, exceeding the level-1 warning threshold, an alarm will be raised.	"Toot~ toot~ toot~"
Fatigue warning (level 2)	When the driver is found to be sleepy, exceeding the level-2 warning threshold, an alarm will be raised.	"Toot, toot, toot, toot, attention please"
Obstruction	When an obstruction covering the camera for monitoring the driver's condition over the set time, an obstruction warning will issued.	"Dang~dang~"
Leaving the post	When the driver deviates from the driving position and the driver's face cannot be detected by the device, an alarm will be raised.	"Dang~dang~"
Distraction prompt	When the driver is distracted from the road ahead, such as looking up, looking down and looking around, an alarm will be raised.	"Watch out road conditions ahead"
Smoking	When the driver smokes while driving, an alarm will be raised.	"No smoking"
Make a phone call	When the driver makes a call while driving, an alarm will be raised.	"Drive carefully"
Yawn	When the driver yawns while driving, an alarm will be raised.	"You are sleepy. Take a rest please"
Substitution prompt	After the vehicle moves and reaches the set speed, the driver's identity will be monitored. If the driver change is detected, a voice prompt will be made.	"Driver has changed"

When RD-CAM-AD500 or RD-CAM-AD501 is equipped, the system can achieve active

safety warning in the forward direction

Alarm type	Description	Voice prompt
Forward collision warning	When the vehicle speed exceeds the set speed, and the collision time with the preceding vehicle is lower than the safety time threshold, an alarm will be raised.	"Toot, toot, toot, toot, toot~"
Low speed collision warning	When the vehicle speed is less than the set speed, and the collision time with the preceding vehicle is lower than the safety time threshold, an alarm will be raised.	Sharp "Tick, tick, tick"
Excessively-close vehicle distance level 1	When the vehicle speed exceeds the set value with the distance maintained less than the set minimum level-1 distance, an alarm will be raised.	"Ding~"
Excessively closed distance level 2	When the vehicle speed exceeds the set value with the distance maintained less than the set minimum level-2 distance, an alarm will be raised.	"Dingding~"
Lane deviation warning	When the vehicle speed exceeds the set value, and the driver deviates from the lane unintentionally, an alarm will be raised.	"Tick, tick, tick, tick, tick, tick, tick, tick"

3.2 Other major function

1) Driver identification

If the vehicle has just started or stopped for over a certain period of time, a substitution will be triggered. The driver identification function will be triggered if either condition is met. The driver's photo will be captured by the device and uploaded to the cloud platform for analyzing, identifying and processing through the server of the cloud end, so as to compare with the driver information bound in the platform previously. In this way, the driver identity can be determined.

2) Self calibration of driver feature posture

When the vehicle speed exceeds the set value after the device starts, the system will enter the self-calibration time of driving posture. Core parameters of the system will be calibrated based on drivers' characteristics and their driving postures in the process. On this basis, posture alarm (incl. looking up, looking down and looking left and right) can be determined. The posture alarm will not be raised until the calibration is completed. The posture alarm can be raised normally after the voice prompt of "Ticktick" made by the device when the calibration is completed.

3) Information acquisition and reporting

GPS information and other vehicle data, such as speed, left and right steering as well as braking can be recorded and stored in the device. Moreover, when an alarm is raised, the alarm related information, including alarm time, type, and the name of the video file corresponding to the alarm

time will be recorded by the device.

Information acquisition is conducted to the device through the butted in-vehicle equipment. Meanwhile, information interaction can be shared between the 4G network and the cloud platform through the in-vehicle equipment.

4) Driving video recording

Simultaneous recording of two cameras is supported by the device. What's more, time, positioning, speed and other information can be overlaid on the video. Besides, It's support for local video storage and remote playback download.

5) Equipment self test

Self test will be conducted on primary system sensors and components when the device starts or at regular intervals. If any fault occurs, the corresponding indicator on the device will be displayed in red; at the same time, fault information will be sent to the cloud platform. If a HMI display is equipped in the system, fault information can be displayed via the HMI display in the system. Faults contain DSM abnormal operation, ADAS abnormal operation, Ethernet abnormal communication, CAN abnormal communication, serial abnormal communication, and SD card abnormal read/write, etc.

6) Alarm linkage

When an alarm event is detected, forensic records of pictures and small videos are supported in all channels of the system. And configuration of different alerts pictures, video upload switches are supported by the platform.

7) System upgrade

Upgrading the system through remotely sending an upgrade package through the cloud platform is supported in the system. In the meantime, upgrading through a local SD card is also available. Copy the upgrade package file into the SD card before starting the device operation. The device is upgraded after hearing "tickticktick" with the device restarting.

8) Analog image output

Also, real-time analog image output is supported by CVBS, which can be used for direction calibration during installation, and connected to other peripherals.

9) Mobile APP linkage

The phone network is connected through the WIFI hotspot in the device. Parameter adjustment calibrating and real-time video viewing can be realized through the APP. See the Appendix for the calibration method.

10) WiFi function

The device can be connected with the mobile phone through WiFi hotspot, and the working condition of the device can be viewed by opening the app of roaDefend, such as viewing real-time video, parameter adjustment, etc

4 Product specifications

Basic Information	operating temperature(°C)	-25~70
	storage temperature (°C)	-40~85
	operating humidity(%)	0~90
	operating voltage(V)	9~36
	rated power(W)	8
	CAN	support
Basic Information	Ethernet	support
	WIFI	support
	TF card	support
	Micro USB	support
	Serial port	RS232
	4G/GPS	support

5 User Notes

1. The product as an active safety assistant driving device cannot replace safe driving and conscious driving. Please drive safely in accordance with the traffic rules.
2. Installation and calibration may affect the recognition and response of the system, which must be conducted by professionals during installation.
3. The recognition and response capabilities of the system may be affected by road surface and weather. Thus, the recognition accuracy of the system may be reduced with unclear road markings are not clear and in bad weather.
4. The product has been designed for improving driving safety and decreasing accident rate. In that case, the clear view of the camera must be guaranteed in the use process, so as to avoid causing damages to the device.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.