Radar-visual Integrated Device Specification

1. Product Introduction

The radar-visual integrated device is a traffic product used for road vehicle detection. It integrates millimeter-wave radar technology and video processing technology, and uses AI intelligent algorithms to achieve data-level fusion of video traffic target information and radar target information. It combines the advantages of radar and video to achieve all-weather perception and full-factor detection of roads.Its detection distance is 350 meters, and it can detect a total of 8 lanes in both directions. It can identify up to 256 moving and static targets at the same time, and on this basis, it can provide basic traffic data such as traffic volume, average speed and occupancy rate, as well as real-time vehicle presence, speed, queue length, coordinates, vehicle type, and various traffic abnormal events. Its outstanding performance can cope with various complex intersection conditions, and provide accurate and rich road condition information, providing comprehensive, accurate and real-time traffic big data for traffic signal control systems.

2. Application scenarios

1) Traffic control at urban intersections: real-time monitoring of traffic information at urban intersections, providing intelligent detection data for traffic light control;

2) Control of key urban sections: real-time detection of key sections, ensuring normal traffic flow and abnormal event detection;

3) Traffic flow statistics of sections: statistics of traffic flow at a certain intersection or section of highway/urban roads, realizing traffic information collection;

4) Vehicle trajectory tracking: vehicle trajectory tracking and intelligent detection of related events in key sections of highway/urban roads;

5) Abnormal event detection: intelligent detection of abnormal events in highway/urban road scenarios, such as illegal parking, driving in the wrong direction, crossing the line, pedestrian intrusion, non-motor vehicle intrusion, occupying emergency lanes, speeding, queue overload, queue overflow, congestion, etc.;

6) Vehicle-road collaboration: in smart city scenarios, optimize traffic organization, realize intelligent detection of sections, and provide roadside detection data for automatic driving or assisted driving of vehicles.

3. Product appearance

The radar-visual integrated device adopts a cyberpunk style design. The collision of black and white makes it full of technology and futuristic sense. The design of large angles on both sides makes it look lighter and thinner visually. As shown in the picture:

Figure 1. Effect diagram of the radar-visual integrated device

3.1 Product Dimensions

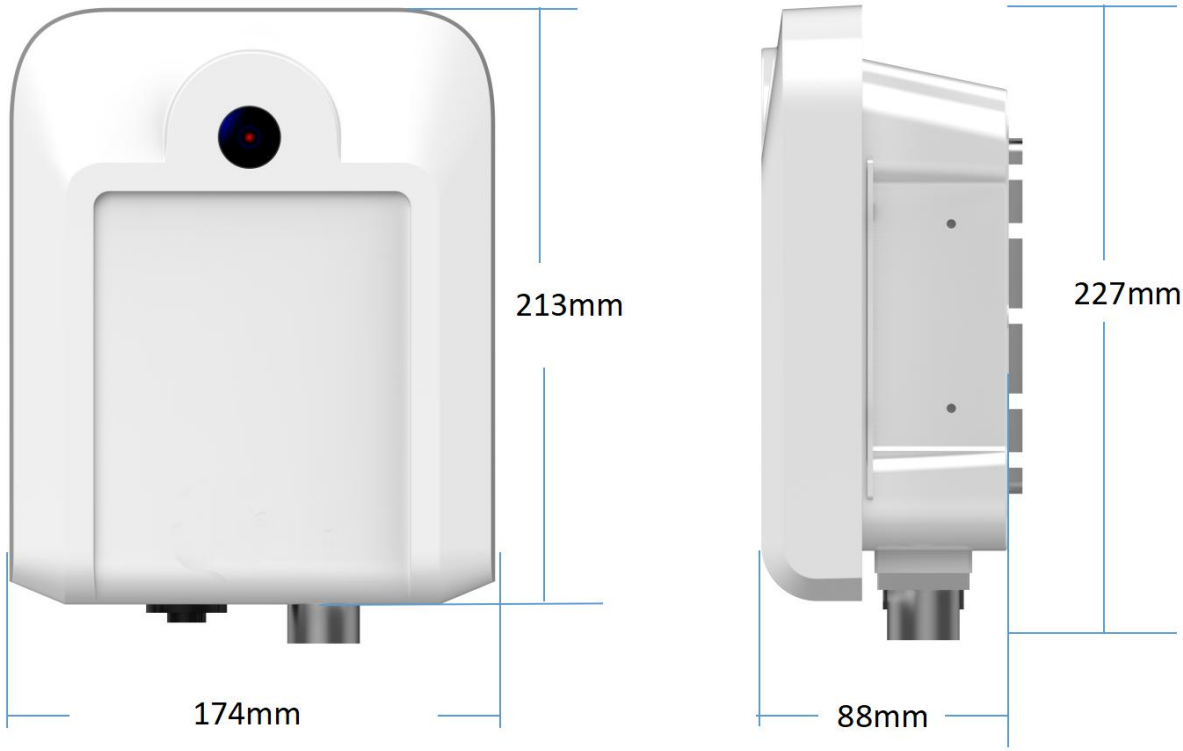

Figure 2. Dimensions of the radar-visual integrated device, unit: mm

4. Technical Parameters:

Basic parameters			
Detection distance	350m		
Number of covered lanes	8 lanes		
Number of tracking targets	256		
Refresh Time	50ms		
Speed range	-300～300km/h		
Video Metrics	Radar and video fusion, 5 megapixels		
Data Detection	Trajectory information: location, speed, type Traffic flow information: flow, speed, occupancy, queue length, etc. Event information: parking, speeding, lane change, wrong-way driving, congestion, etc. Visualization information: video stream, target features		
Accuracy Detection	Position accuracy: 0.2m Speed accuracy: 0.1km/h Traffic flow accuracy: ≥99% Event accuracy: ≥99%		
Environmental Parameters			
Temperature	-40 ~ +85℃	Humidity	0 ~ 95%
Installation height	6~8m	Protection level	IP67
Other Parameters			
Power supply	24V DC	Communication interface	RJ45
Power	< 12W	MTBF	100000h

Table 1. Technical Specifications of the **radar-visual integrated device**

5. Functional Description

1) Picture capture function: you can manually capture pictures through the software;

2) License plate recognition function: the license plates of vehicles passing through the monitoring area can be recognized through software;

3) Target type display function: The software can display the target type as motor vehicles (including large cars/medium-sized cars/small cars), non-motor vehicles and pedestrians;

4) Track continuity detection function: The radar detects the track continuity of the target;

5) Real-time queue length detection function: supports static and dynamic queue length detection functions, and can output queue length, the position of the first and last vehicles in the queue, and the number of vehicles in the queue through the software. Dynamic queue condition parameter values can be set according to needs. The relative error of queue length detection is ±5%;

6) Traffic information statistics function: traffic volume, average speed, lane time occupancy, average headway, average vehicle body distance, 85% speed;

7) Abnormal event reporting function: It can detect abnormal traffic events, including abnormal parking, reverse driving, lane change, ultra-high speed, ultra-low speed, congestion, line crossing, intrusion, queue overrun (overflow), emergency lane occupation, etc. The detection area can be configured by the host computer, the departure alarm mechanism can be customized, and the alarm information can be output.