No: HURYS-J2610003

260m Holographic Detection Radar White Paper

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Contents

1. Product Overview

The DTAM D29-V radar-video fusion microwave detector is a traffic sensing device independently developed by our company. It features a wide detection range, high accuracy, and stable performance, capable of covering up to six lanes in both directions with a maximum detection range of 260 meters. Equipped with the industry's most advanced traffic object tracking algorithm, it can identify and accurately track up to 256 objects in real time within the coverage area. Even in high-density, low-speed environments, it consistently delivers excellent detection performance.

2. Product Features

- Supports multi-lane and large-area object detection, capable of accurately outputting information such as speed and position. It provides horizontal coverage for up to 8 lanes and longitudinal coverage from 25 to 260 meters.
- Integrates radar and video in a unified design. The multi-sensor fusion mode enables multi-object radar tracking, coordinate matching, and data fusion.
- Incorporates the functions of traditional microwave vehicle detectors, offering data such as vehicle speed, traffic volume, headway time, vehicle classification, queuing, and space occupancy rate.
- Detection accuracy: traffic flow accuracy ≥95%; queue length accuracy ≥90%; event detection accuracy ≥90%, based on typical traffic scenarios.
- Supports the detection of pedestrians, non-motor vehicles, large and small vehicles.
- Radar supports NTP time synchronization and manual time setting.
- The radar operates reliably under all weather and lighting conditions, unaffected by rain, snow, fog, or ambient light.

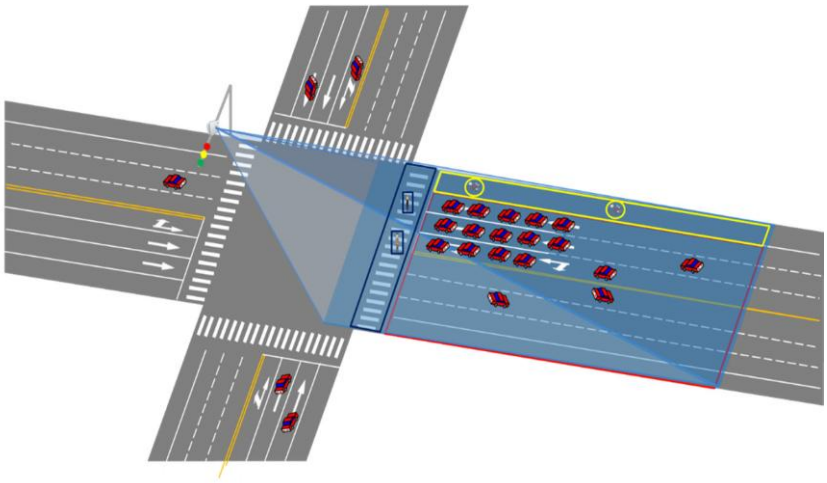
3. Installation Instructions

Types of urban intersections include: cross intersections, T-junctions, and multi-

leg intersections. It is recommended to install the device on the traffic signal pole. Please follow the installation diagram strictly as shown below.

Typical installation method for intersections:

Method 1: Installation and deployment of signal light poles



4. Application Instructions

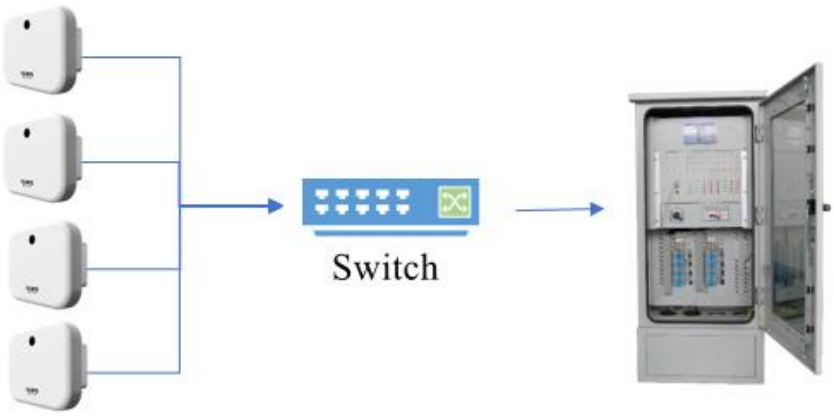
The DTAM D29-V integrated wide-area radar microwave detector, combined with video detection capabilities, represents the future direction of traffic sensing technology. This device is equipped with features such as stable tracking of vehicle group trajectories, vehicle feature recognition, traffic flow data collection and statistics, as well as traffic event detection and identification. It is well-suited for various complex traffic scenarios, including high-volume traffic and mixed motor/non-motor vehicle flow. The system is widely used in urban intersections, road sections environments, providing scientific, advanced, and comprehensive intelligent traffic sensing solutions for applications such as urban signal control .

Table 1: Traffic data table

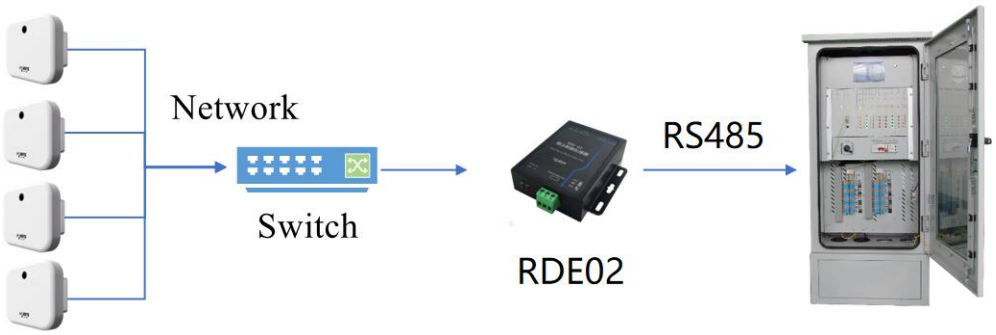
No	Data Categories	Data Contents
1	Pulse data	Presence state
2	Vehicle real-time data	ID, speed, location
3	Vehicle passing data	Passing speed, passing time, and occupancy time

4	Statistical data	Traffic volume, average speed, time occupancy rate, headway time, 85th percentile speed
5	Queue data	Queue length
6	Area data	Number of vehicles in section, spatial occupancy, average speed in section
7	Incident data	Queue overflow incident

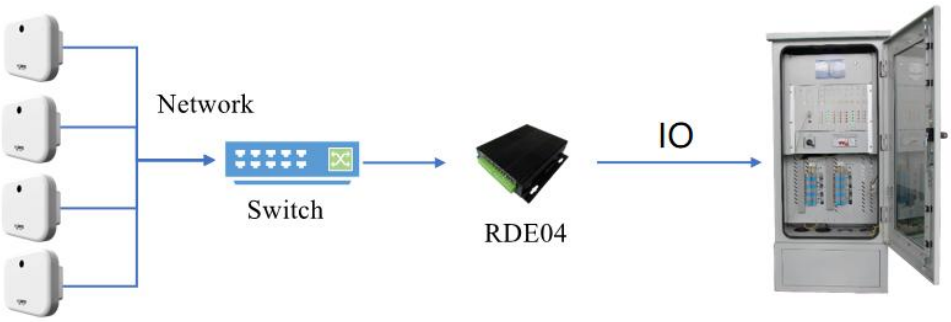
Attached: Typical cases of docking with intersection controller



Case #1: docking with intersection controller



Case #2: docking with intersection controller

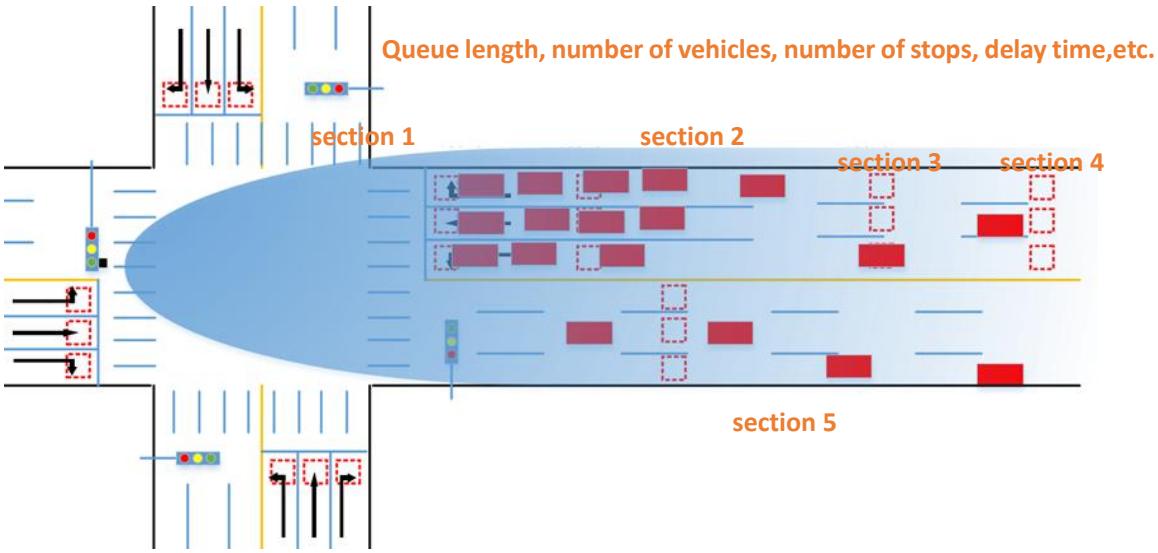


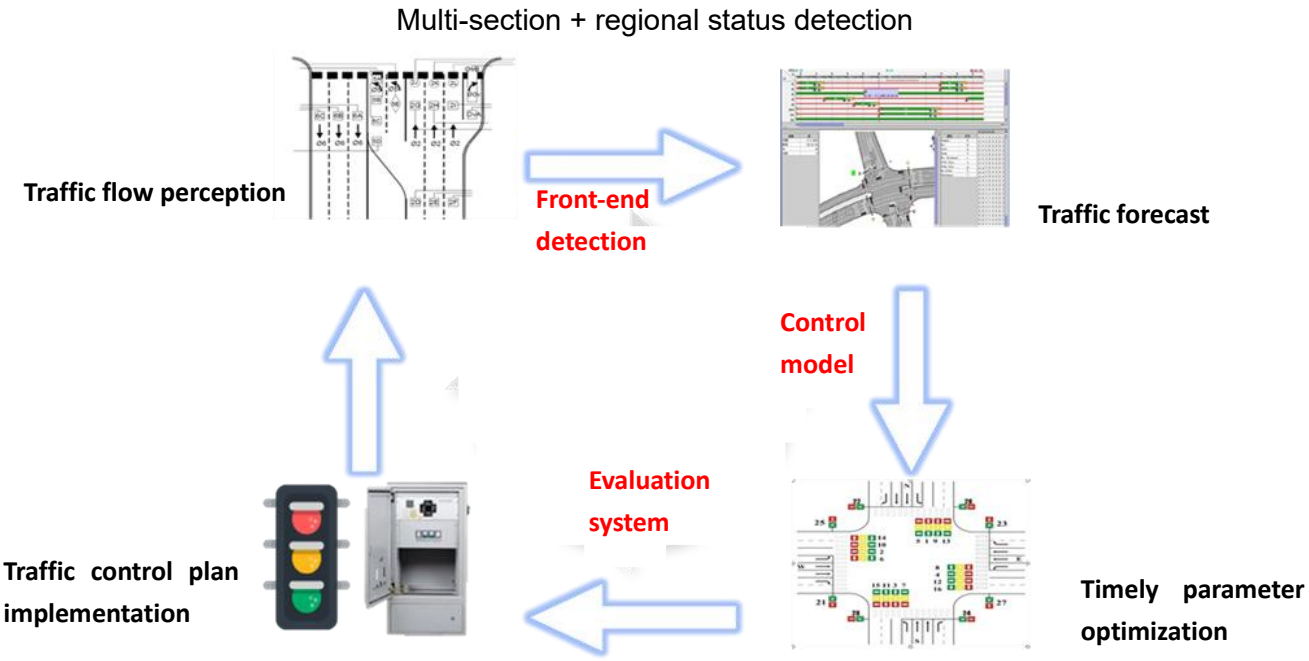
Case #3: docking with intersection controller

4.1 Urban Intelligent Traffic Signal Control System

The radar-video fusion microwave detector employs a combined detection model of “multiple cross-sections + zone status + event detection,” efficiently adapting to urban traffic signal control systems. It accurately outputs cross-section data for each lane, vehicle distribution information within zones, queue overflow events, and vehicle characteristic information. It also analyzes and compiles trajectory data of objects within each cycle, providing efficient, concise, and real-time comprehensive data throughout the entire process. This fully supports traffic signal control modes such as inductive control, adaptive intersection control, mainline green waves, area control, reversible lane control, and bus priority coordination control.

The traffic signal control system uses real-time queue lengths and vehicle counts in all directions provided by the radar-video fusion microwave detector, combined with cycle traffic volume data to calculate signal cycle lengths and estimate green light durations. By dynamically adjusting the green signal ratio based on real-time multi-section presence data, vehicle distribution, and event information, it improves green light utilization efficiency. After each cycle, the system evaluates signal performance by analyzing radar-provided data such as the number of stops and delay times, enabling fine-tuning of signal control strategies to achieve optimal operation.





Structure diagram of intersection signal control system model

5. Product Parameters

Table 2: Radar parameters

No	Specifications	Parameters
1	Frequency Band	77GHz
2	Coverage	8 lanes in both directions
3	Simultaneous Detection	Up to 256 objects
4	Maximum Detection Range	25 ~ 260m
5	Range Accuracy	0.1m (near beam)/0.4m (far beam)
6	Range Separation	0.39m (near beam)/1.79m (far beam)
7	Range of Speed Coverage	-200km/h～+200 km/h
8	Speed Accuracy	0.1m/s
9	Speed Separation	≤±0.25m/s
10	FOV	Near beam 90° (horizontal)/18° (vertical) Far beam 18° (horizontal)/18° (vertical)
11	Angle Accuracy	0.3° (near beam)/0.1° (far beam)
12	Angle Separation	3.2° (near beam)/1.6° (far beam)

Table 3: Video parameters

No	Specifications	Parameters
1	Sensor	1/2.5 inch CMOS
2	lens	12mm fixed focus lens
3	Pixel	2592*1944 px
4	Video FOV	±13°
5	Image format	JPEG
6	Video protocol	Supports docking with ONVIF protocol and national standard GB/T 28181 protocol
7	Network protocols	Supports TCP/IP, HTTP, RTSP and FTP transfer
8	Max resolution	2592*1944px
9	Compression standards	H.265/H.264/MJPEG
10	Video frame rate	Mainstream:2592*1944 2560*1440 1920*1080 1-20 fps Sub-stream:1280*720 704*576 640*480 352*288 1-20 fps
11	Output bit rate	16kbps~20Mbps adjustable

Table 4：Other radar parameters

No	Specifications	Parameters
1	Operating temperature	-40℃～+70℃
2	Working voltage	DC 24V（Wide voltage range: 20～28V）
3	Working humidity	0～95%
4	Power Consumption	≤12 W
5	Installation height	6～8 meters
6	IP rating	IP67

6. Hardware interface and dimensions

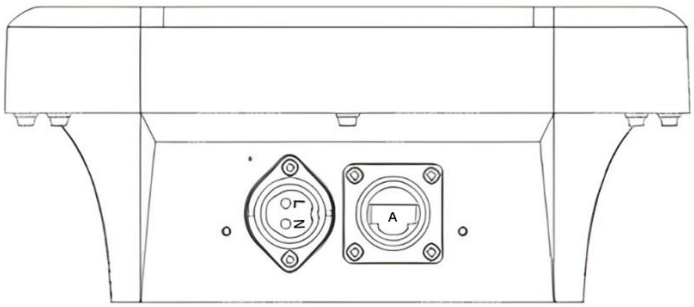


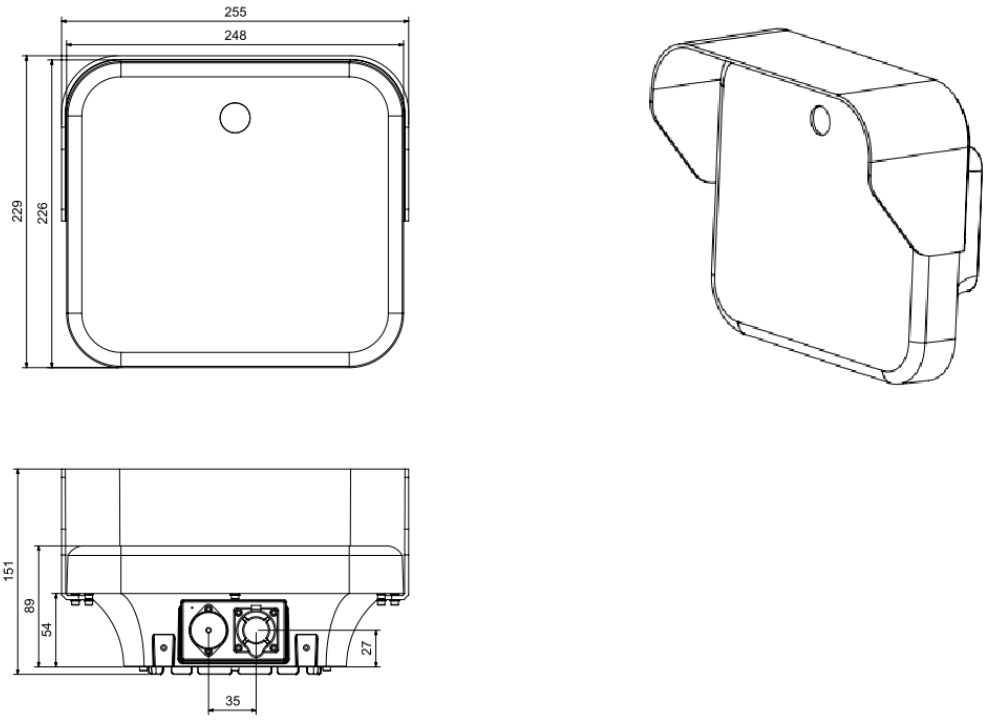
Table 5: Functions corresponding to each interface

Mark	Name	Description
L	V+	DC 24V
N	V-	GND
A	RJ45	Interface

Notes:

✧ It is strictly forbidden to use AC 220V voltage to directly power the radar.

✧ When selecting the installation point, avoid placing the radar too far away from the power supply or transmission node. If the radar data transmission exceeds 80 meters, optical fiber must be used for link access.



DTAM D29-V Layout

Table 6: Product dimensions

No.	Parameter name	Description
1	Dimensions	255mm×229mm×151mm(Length * Width * Height)
2	Weight	1600g
3	Material	PC