F4A PARKING GUIDANCE SMART CAMERA

PRODUCT SPECIFICATION

Vision-Zenith

DOC No.: VZDLF0007 **Version No.:** v1.01

Release Date: Sep 21, 2022

Contents

Appearance

Release History

Version Number	Release Date	Change Information
V1.01	Sep 21, 2022	Format specification adjustment
V1.00	Aug 1, 2022	Initial release

1 Product Introduction

1.1 Brief

The F4A parking smart camera is a video monitoring device used to detect the status of parking spaces in parking guidance and reverse car finding systems. The product uses a camera to capture real-time video of the parking space, uses visual recognition technology to detect whether a vehicle is parked in the space, and controls the color of the LED light according to the status of the space to guide the vehicle. The 4MP UHD imaging system provides high-definition picture quality even in low light conditions.

F4A provides a number of optional functions, supporting up to 3 external LEDs, which can achieve 1:1 accurate guidance of parking spaces and LEDs, Bluetooth function provides precise positioning information in application scenarios such as indoor parking level navigation and reverse car search, and can link up with Bluetooth ground lock to control the status of parking spaces, the lighting alarm function with abnormal events visual recognition algorithm, timely detection of foreign objects occupying the space phenomenon intervention management, improve the parking space Utilization rate. The built-in pan-tilt can be remotely debugged angle, and the binocular version supports the status recognition of 6 parking spaces at the same time, which significantly reduces the deployment and maintenance costs.

F4A supports structured vehicle structured data and international license plate, providing the optimal intelligent identification terminal for smart parking lots, which can be applied to a wider international market.

1.2 Applications

The product is commonly applied to various commercial complexes, parks, high-end hotels and other parking lots. The main application scenarios including:

- Real-time monitoring of parking space idle status, indicating empty parking spaces through lights, guiding vehicles to find parking spaces
- Monitor whether there are parking irregularities, foreign objects occupying the parking space or people staying in the parking lot, and give light alarm when the event occurs
- Built-in Bluetooth beacon to achieve the parking lot owner information positioning, to help owners reverse the vehicle search
- Control the Bluetooth ground lock on the parking space to realize the application of allowing only white-listed vehicles and VIP customers to park
- Support international license plate recognition, suitable for international market

1.3 Key Features

4M Clearer Image Quality

Car parking smart camera is equipped with the industry's advanced 4 million imaging solution, which provides video and picture output with a maximum of 4MP resolution and better adaptability to night, smooth light, backlight and other light scenes. Together with Vision-Zenith unique intelligent ISP (image signal processing) algorithm, it can not only meet the demand for license plate recognition, but also provide clearer details of car headers and car markers, which helps the algorithm to better identify.

High precision car position detection and scenario-based algorithm

- Comprehensive license plate recognition rate of 99.6%: supports recognition of license plate numbers and colors of ordinary blue plates, single and double-layer yellow plates, large and small new energy plates (small A and B fields), single and double-layer police plates, single and double-layer armed police plates, single and double-layer military plates, embassy plates, consulate plates, coach plates, etc., supports overseas license plate recognition, and mainstream license plate recognition rate in typical scenes Up to 99.6%.
- Changing light accuracy rate of 99.8%: pixel enhancement and algorithm optimization greatly improve parking experience of parking lot users.
- Scenario-based event perception: support for event detection such as pressure line parking, non-white list vehicle occupancy, foreign object occupancy, and personnel hold-up.
- Vehicle structured data: supports vehicle structured data, which is the best choice for smart parking.

Rich product form with ultimate design

- Precise guidance: The monocular camera supports external LED, realizing 1:1 precise guidance of LED and parking space.
- Six car parking spaces coverage: binocular camera can cover 6 car parking spaces, reducing deployment difficulty and cost by at least 50%.
- Simplified deployment: Support standard POE and non-standard POE to simplify deployment. Non-standard POE can support up to 16 monocular camera handhelds and 8 binocular camera handhelds (no external lights).
- Remote debugging: camera built-in pan-tilt, achieving ready-to-install and deployment, remote centralized debugging, saving deployment time more than 50%.
- Adapt to complex car park environment: the camera supports a variety of LED control modes, and achieves dead-end coverage of car parking spaces in complex corner scenes through identification data sharing and LED sharing between cameras.
- Rich business solutions: support Bluetooth, comes with Bluetooth beacons to support car finding navigation, with Bluetooth ground lock and parking space white list to realize exclusive parking space, parking space reservation and other refined operations.

Efficient operation without humanization: Identify abnormal events such as non-white list cars, pressure line parking, foreign objects occupying space, and stranded people, and promptly perform light reminding and event pushing to improve parking space utilization and operation efficiency.

Comprehensive development docking support, easy for users to secondary development

- SDK development kit: provide SDK development kit for Windows and Linux environment, supporting VB, C#, Delphi, C++ and other development languages.
- API protocol interface: support API interface based on TCP, HTTP and other standard protocols to meet the docking of camera and platform system

1.4 Ordering Information

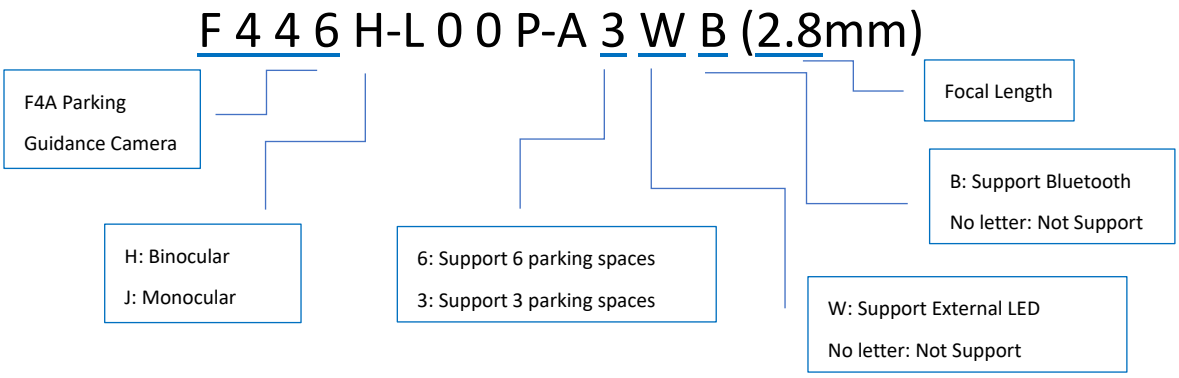

Figure 1-1 F4A Model Coding

The F4A is available in different models with different hardware features to meet the differentiated requirements of users.

Ordering Model	Specification
F446H-L00P-A6	F4A Binocular lens，6 Spaces，400MP，Pan-tilt。
F446H-L00P-A6B	F4A Binocular lens，6 Spaces，400MP，Pan-tilt. (Bluetooth)
F446J-L00P-A3	F4A Monocular lens，3 Spaces，400MP，Pan-tilt.
F446J-L00P-A3W	F4A Monocular lens，3 Spaces，400MP，Pan-tilt. (External LED)
F446J-L00P-A3B	F4A Monocular lens，3 Spaces，400MP，Pan-tilt. (Bluetooth)
F446J-L00P-A3WB	F4A Monocular lens，3Spaces，400MP，Pan-tilt. (External LED, Bluetooth)

Table 1-1 F4A Model List

In order to adapt to different lane conditions, installation distances and vision requirements, customers can choose the appropriate lens accessories according to the deployment environment. The lens is a mandatory accessory for the F4A and must be selected at the time of purchase and installed in the entire machine before shipment. Optional lens accessories are listed below.

Ordering Model	Specification	Application description
TJ-JT-024	2.8mm prime lens	Recommended mounting distance (Verticle) 2.0~3.5m , (Horizontal) 2.5~5.0m.
TJ-JT-025	4mm prime lens	Recommended mounting distance (Verticle) 2.0~3.5m , (Horizontal) 4.0~8.0m.

Table 1-2 F4A Required Accessories List

In order to meet the deployment methods of different scenarios for users, F4A offers the following optional accessories.

Accessory	Modeling No.	Specifications
External LED	F4A-C	External LED

Table 1-3 F4A Optional Accessories List

1.5 Product-related documents and tools

- Parking Guidance Smart Camera - Product Specification
- Parking Guidance Smart Camera - Quick Start Guide
- Parking Guidance Smart Camera - User Manual
- Parking Guidance Smart Camera Log Usage Instructions
- Parking Guidance Smart Camera HTTP Interface Documentation
- SDK Development Kit
- Batch configuration tool

If needed, you can visit the official website or ask the technical support staff for the relevant documents and tools.

2 Specification

2.1 Hardware Info

Category	Metric items	Detailed Parameters
Imaging	Product picture	
	Sub series	F4A Monocular Version | F4A Binocular Version
	Lens	2.8mm, 4,0mm optional prime lens
	Pixels	400MP
	Maximum resolution	2560 * 1440
	Low illumination	2LUX
	Electronic shutter	10-100ms
Image metrics	Image settings	Brightness, contrast, saturation, resolution, image flipping, exposure time, etc
	Noise reduction	Support 2D/3D noise reduction
	White balance	Auto
Hardware functions	Pan-tilt	Auto pan-tilt, support remote debugging, rotation angle -20°~-40°
	Indicator	7 colors available (red, green, white, yellow, purple, dark blue, light blue)
	Bluetooth	Support
Physical Interfaces	Network interface	2ch 10/100Mbps adaptive RJ45 port
	RS485	1 way
	LED indicator	Support 3-way LED External | Not support
Operation Requirements	DC power supply	Standard working voltage DC 12V/1A, support DC 9~36 width power supply
	Standard POE	Support 802.3af, standard PoE
	Non-standard POE	With non-standard POE combiner kit, support up to 16 monocular camera handlers and 8 binocular camera handlers
	Power consumption	Monocular≤3W, Binocular≤5W, External LED≤2W
	Temperature	Operating temperature: -20°C~60°C
	Humidity	10%～95% (Non condensation)
	Electrostatics	Contact 6KV, air 8KV
	Surges	10/700, common mode 4KV, differential mode 2KV
	Vibration resistance	Gb
Structure	Dimensions	129mm(L) * 129mm(W) * 122mm(H)
Some models support Bluetooth, external LED		

Table 2-1 Hardware Info

2.2 Functions

Category	Item	Description
Image parameters	Video compression standards	H.264/H.265
	Video resolution	Main code stream: 2560*1440
		Sub code stream: 640*360、704*576、1280*720
	Video bitrates	512Kbps~5000Kbps
	Video frame rate	1~25 frame
	Image compression	JPEG
	Image resolution	640*360、704*576、1280*720、1920*1080、2304*1296、2560*1440
	Image algorithm	Built-in VZ intelligent ISP algorithm, intelligent optimized dimming algorithm, complex scene adaptive.
Recognition Algorithm	Parking space detection	Monocular 1~3 parking space , Binocular 1~6 parking space
	Car parking status recognition rate	≥99.8%
	Parking space changing light time	Exit/entry，≤3s
	Automatic wire frame for car parking spaces	Automatic recognition of parking spaces and generates parking space wireframes
	Recognition Rate	≥99%
	Recognition Speed	After stopping，≤3s
	International LPR	Support
	Unlicensed vehicle recognition	Support
	Pressed line parking recognition	Support
	Foreign body occupancy recognition	Support, can identify two-wheelers, three-wheelers, shopping carts, cone buckets
	Personnel retention recognition	Support
Functions	Parking space whitelist	300 in total
	Parking space LED interconnection	Support
	External LED indicator	Monocular camera support
	Event lighting prompts	Pressed line parking, foreign body occupancy, Personnel retention, non-whitelisted vehicles
	Bluetooth reverse car-finding	Support, bluetooth positioning
	HTTP push	Support uploading recognition results, offline retransmission
Communications	Network protocol	TCP/IP、DHCP、ARP、DDNS、HTTP、NTP、RTSP、ONVIF

	Bypass networking	Support, up to 128 devices for image transmission, or 16 devices for video transmission. (This function is not supported when using standard POE)
	Bluetooth	BLE 4.2
	Serial port	RS485
Others	User management	Support
	Management tools	PC management tools, SDK development kit
Some models support Bluetooth, external indicator		

Table 2-2 Function Specifications

2.3 Interface

2.3.1 Interface Diagram

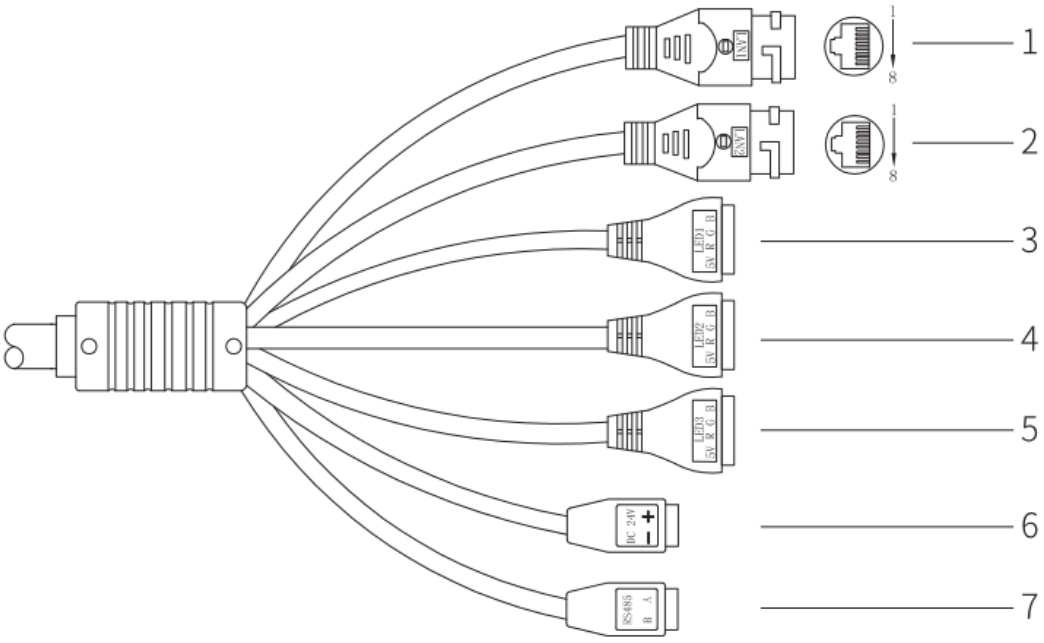

Figure 2-1 Tail Interface Diagram

No.	Function	Identification	Description

1	Network Interface	LAN1	Support 10/100Mbpsethenet transmission
2		LAN2	Support bypass, support POE power supply
3	External LED	LED1	Connect an external LED to provide 5V power supply and light control for the external LED (Support external LED models, the tail cable has the interface)
4		LED2	
5		LED3	
6	Power Supply	DC24V	Standard working voltage DC 12V/1A, support DC 9~36V width power supply
7	Serial Port（RS485）	RS485	Connect to parking space guide signs in parking lanes and provides data RS485 data transmission

2.3.2 Network Interface

The RJ45 interface marked as LAN1/LAN2 in the device tail is the camera Ethernet interface, which is used to transmit camera control commands, capture image results and video streams. The default factory IP address of the camera is 192.168.1.100, user name admin, password admin. users can browse images and configure camera parameters through a web browser.

2.3.3 External LED Interface

Tail wire provides 3 external LED wires, following is the wiring method.

Tail Identification	Signal	Application	Remark
LED1	5V	LED power supply	5V terminal connects to the 5V terminal on the external lamp tail wire to supply power to the external lamp. R/G/B terminals are connected to the R/G/B terminals on the external lamp tail wire port in order to control the light color.
	R	External control lamp_LED_RED signal	
	G	External control lamp_LED_GREEN signal	
	B	External control lamp_LED_BLUE signal	
LED2	5V	LED power supply	
	R	External control lamp_LED_RED signal	
	G	External control lamp_LED_GREEN signal	
	B	External control lamp_LED_BLUE signal	
LED3	5V	LED power supply	
	R	External control lamp_LED_RED signal	
	G	External control lamp_LED_GREEN signal	
	B	External control lamp_LED_BLUE signal	

Table 2-4 External Lamp Interface Description

2.3.4 Synthetic Interface

The RS485 interface is a non-isolated differential half-duplex interface, supporting a maximum baud rate of 115200, and already contains a 120 ohm termination resistor internally. It is recommended to add a 120 Ohm termination resistor at the other end of the bus when performing long line transmission. The effective transmission distance is 100 meters.

2.4 Mechanical Dimension

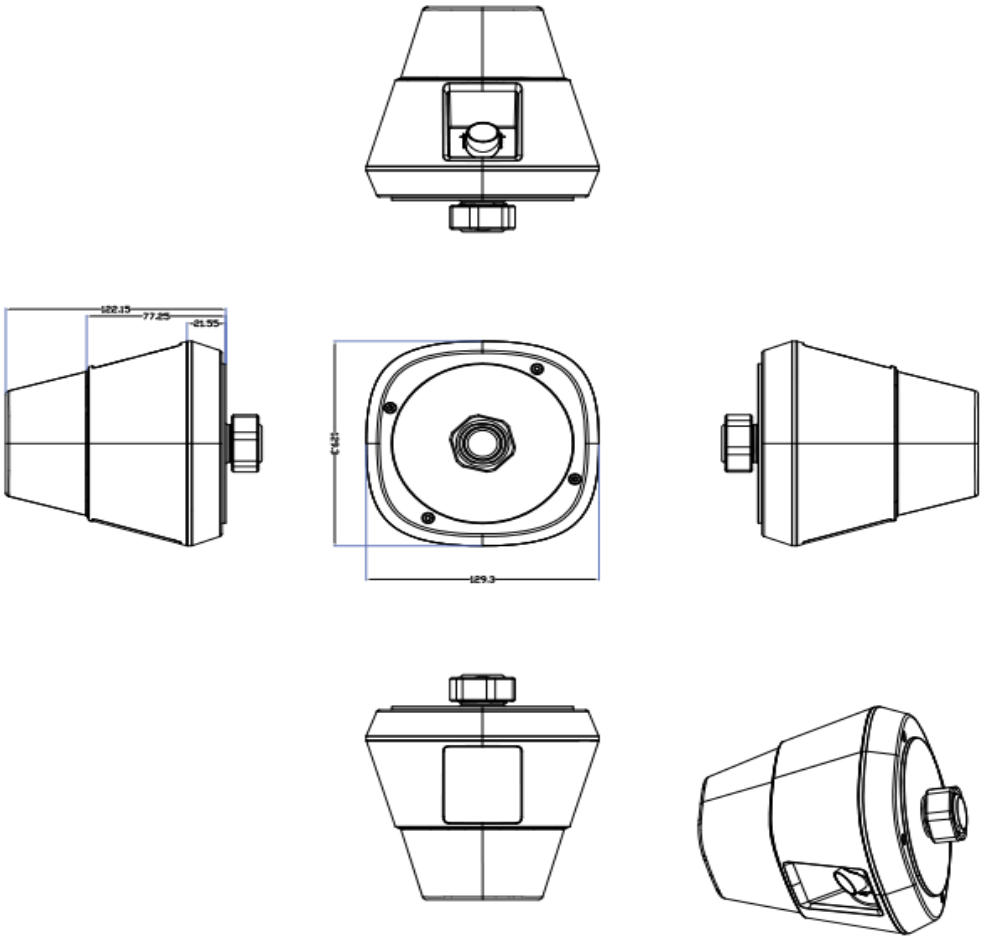

Figure 2-2 F4A Mechanical Dimensional Drawing

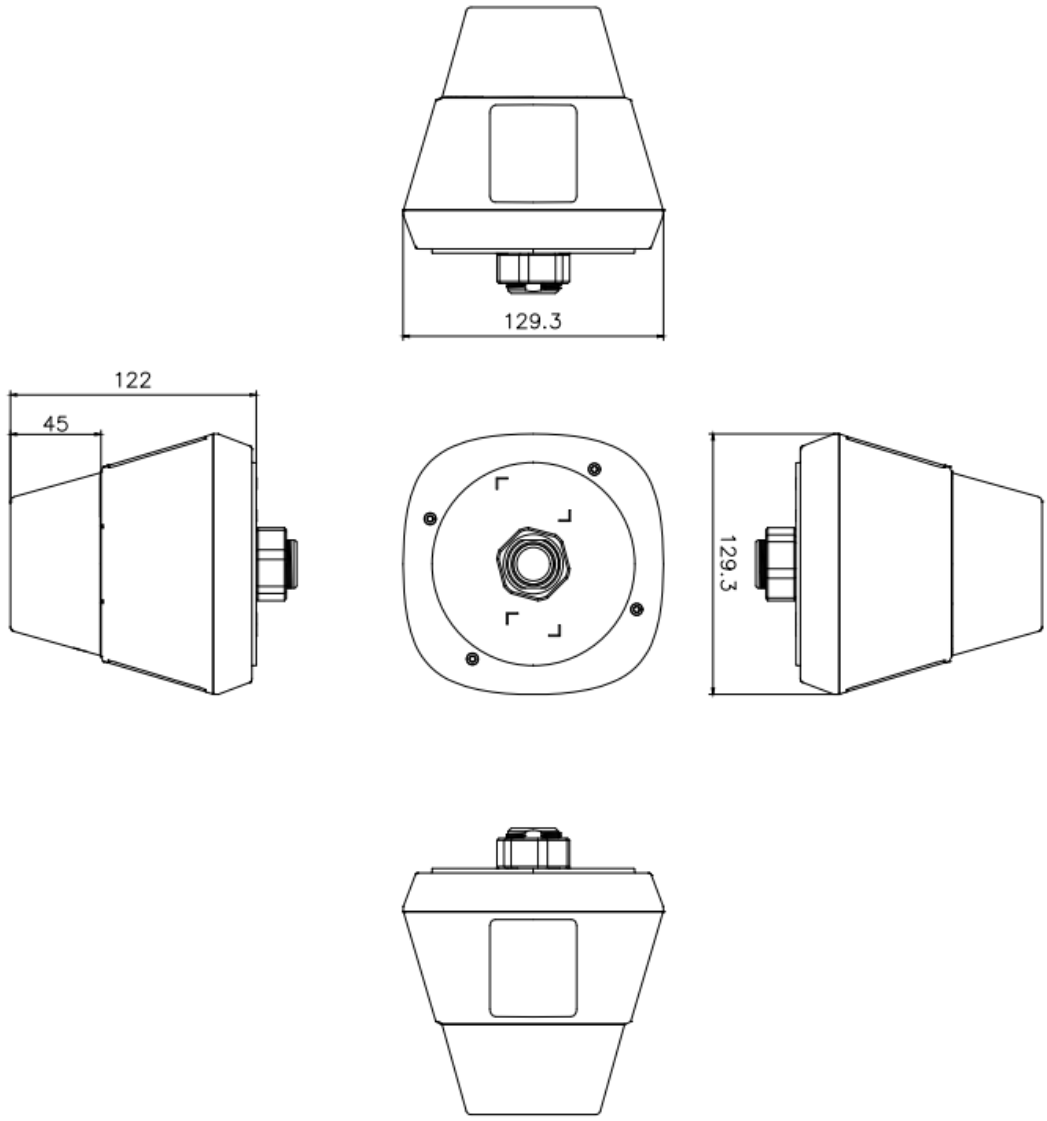

Figure 2-3 F4C External LED Mechanical Dimension

3 Company Info

Vision-Zenith Tech. Co., Ltd.

TEL: 028-87931722

Website: https://en.vzenith.com/

Address: 7/F, Tianfu Jingrong Building, No. 2039, south section of Tianfu Avenue, Tianfu New District, Chengdu, Sichuan Province, P.R. China, 610200