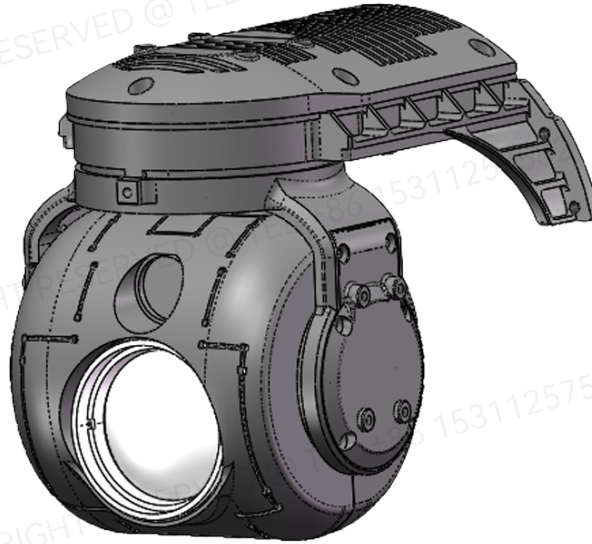


# IRCa-170 Smart Tracking Pod

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ZW-IRCa-170 dual-spectral optical head is a miniature day-night electro-optical reconnaissance device integrating visible light and infrared capabilities, suitable for day and night operations. It automatically searches and tracks stationary/moving targets while outputting frame angle information. Its compact and shock-resistant design makes it ideal for fixed-wing drones, rotary-wing drones, and similar equipment, enabling tasks such as day-night reconnaissance, point surveillance, search and tracking, target identification, and guided strikes.

## Features

- Features visible light and infrared reconnaissance capabilities.
- Equipped with line-of-sight stabilization (two-axis stabilization).
- Supports manual and automatic target tracking functions.
- Provides output of electro-optical payload status information.
- Offers electronic zoom functions for visible light and infrared images.
- Includes status parameter display and identification frame visibility control.
- Capable of typical target recognition.
- Includes tracking gate fine-tuning functionality.

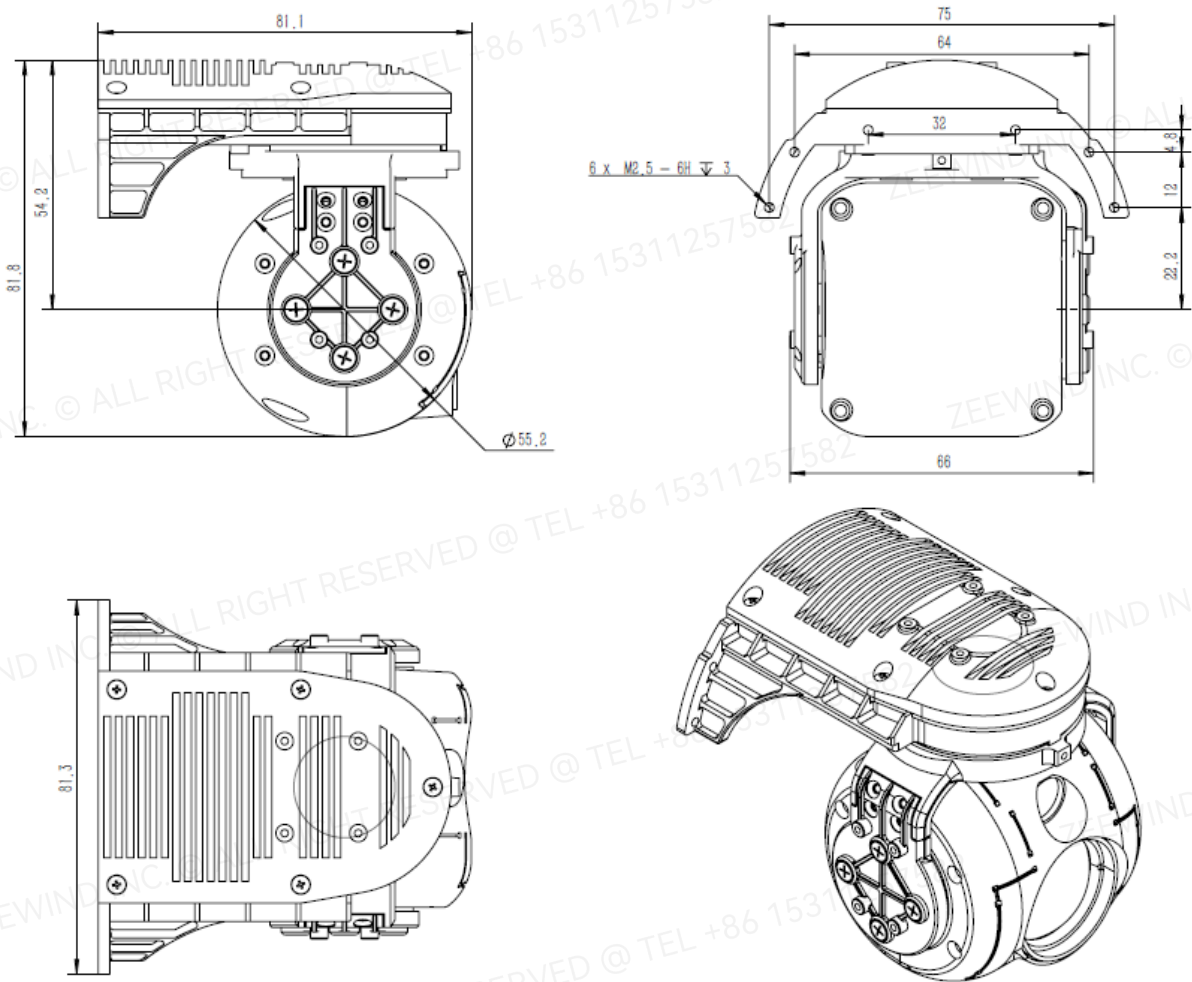
## System Components

The device mainly consists of a two-axis stabilized turret and an electro-optical payload pod. The stabilized turret includes a U-shaped bracket, interface unit, and servo control unit. The mission payload pod primarily

comprises visible light camera components, infrared thermal imager components, and image processing and tracking units.

## Physical Structure

### Outline Dimensions and Mechanical Mounting Interfaces



### Electrical Interfaces

The external electrical interfaces adopt the standard J30-15ZKP metal connector, including power interface, image interface, and communication interface. The onboard end can use the J30-15TJL connector for docking with the optical head. The external electrical interface definitions are as follows:

Number	Definition	Type	Description
1	VCC	Power	Power input DC 24V $\pm$ 6V
2	GND	Power	Power input DC 24V $\pm$ 6V
3	Data+	Output	Image data signal + (RS422)
4	Data-	Output	Image data signal - (RS422)
5	CLK	Output	Image clock signal - (RS422)
6	CLK+	Output	Image clock signal + (RS422)

Number	Definition	Type	Description
7	FC_232_TX	Output	Serial communication send (to flight controller)
8	FC_232_RX	Input	Serial communication receive (from flight controller)
9	Second pulse +	Power	Serial ground (to flight controller)
10	Second pulse -	Output	/
11	Explosion switch 1	Output	/
12	Explosion switch 2	Output	/
13	Reserved	Output	/
14	Reserved	/	/
15	Reserved	/	/

1. In the serial communication interface, TX and RX refer to transmit and receive for the payload device.

2. Video output uses the RS422 level-based SPI bus protocol.

## Technical Specifications

### Gimbal

1. Turret type: Two-axis, two-frame.

2. Search range:

◦ Azimuth: -115° to 115°.

◦ Elevation: -80° to +15° (0° is horizontal forward, positive is upward).

3. Maximum angular velocity:  $\geq 60^{\circ}/s$ .

4. Maximum angular acceleration:  $\geq 60^{\circ}/s^2$ .

5. Stabilization accuracy:  $\leq 3\text{mrad}$  (RMS).

### Visible Light Lens

1. Target recognition distance: During daytime, with visibility not less than 3km and relative humidity not exceeding 90%, target recognition distance for a 4m×6m vehicle:  $\geq 1000\text{m}$ .

2. Image sensor: Color CMOS.

3. Resolution: 3840×2160.

4. Pixel size: 2 $\mu\text{m}$ .

5. Focal length: 12mm.

6. Field of view:  $\geq 25^{\circ}$  (H) × 15° (V).

7. ×5 electronic zoom capability.

### Infrared Lens

1. Target recognition distance: During nighttime, with visibility not less than 3km, relative humidity not exceeding 90%, and background temperature difference not less than 5K, target recognition distance for a 4m×6m vehicle:  $\geq 700\text{m}$ .

2. Infrared detector: Uncooled long-wave (8-14 $\mu$ m).
3. Resolution: 640 $\times$ 512.
4. Pixel size: 12 $\mu$ m.
5. Focal length: 20mm.
6. Field of view:  $\geq 20^\circ$  (H)  $\times$   $15^\circ$  (V).
7.  $\times 2$  electronic zoom capability.

## Power Supply

1. Voltage: 24V $\pm$ 6V DC input, ripple  $\leq$ 100mV.
2. Power consumption: Average  $A_v \leq 10W$ , peak  $\max \leq 20W$ .

## IO Interfaces

1. Control interface: RS232 serial port.
2. Video interface: Synchronous 422 interface based on SPI protocol.
3. Video format: Supports H.264/H265.
4. Output bitrate: Adjustable 2M/4M.

## Environmental Adaptability

1. Operating temperature: -40 $^\circ$ C to +55 $^\circ$ C.
2. Storage temperature: -45 $^\circ$ C to +60 $^\circ$ C.
3. Low pressure: Operational at 5500m altitude.
4. Vibration: According to GJB150.16A-2009 procedure I, for fixed-wing aircraft with propellers.
5. Shock: According to GJB150.18A-2209 procedure I, functional shock using post-peak sawtooth wave, three axes, six directions.
6. Wind resistance: Operational under 12m/s wind speed (level six wind).
7. Rain resistance: Operational in light rain conditions (rainfall  $\geq 0.5$ mm/h).

## Physical Specifications

1. Product weight: 300g.