

# SPCraft5

Full-Function Professional USV

Smart Precision Navigation



Expandable Platform

# SPCraft5 *unmanned surface vessel (USV)*

SPCraft5 is a multifunctional unmanned surface vessel (USV) developed by Guangzhou Spherefix Navigation Technology Co., Ltd. Built for underwater surveying, patrol and reconnaissance, and water-quality monitoring, it integrates a proprietary intelligent control system and supports payloads such as echo sounders, side-scan sonar, and water-quality sensors. Featuring high automation, strong anti-interference performance, and solid expandability, SPCraft5 works seamlessly with iSail to deliver end-to-end data acquisition and analysis—offering a safer, more efficient, and more precise solution for diverse water environments.



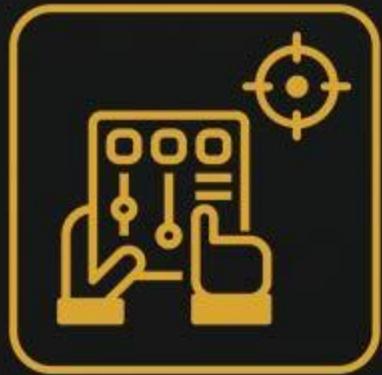
HEIGHT	DIAMETER	WEIGHT
254mm	980*520*254mm	30kg

## Integrated Portable Design



The streamlined, fully curved hull is constructed from high-strength polymer composite and Kevlar fabric, achieving both lightweight design and structural rigidity. No assembly is required — the vessel is ready for deployment right out of the box, enabling fast transportation and rapid field operations.

## High-Precision Intelligent Control



Equipped with self-developed high-precision navigation and control algorithms, the system supports RTK positioning accuracy of 8 mm + 1 ppm horizontally. Dual-antenna GNSS and an integrated IMU ensure stable sailing and highly accurate route tracking. Intelligent safety features include automatic obstacle avoidance, shallow-water alerts, and low-battery return.

## Long Endurance & Powerful Propulsion



A dual lithium battery system supports hot-swappable replacement, enabling up to 7 hours of endurance at 1.5 m/s and an economical range of up to 38 km. The 900 W brushless motor and anti-clog propeller provide strong thrust and a maximum speed of 7 m/s, allowing the vessel to operate reliably in complex flow conditions.

## Multi-Functional Expandability



SPCraft5 supports a wide range of sensors, including water-quality probes, side-scan sonar, and LiDAR. An open SDK is provided for secondary development, making it adaptable to water-quality inspections, concealed-pipe investigations, topographic surveying, emergency patrol, and many other mission scenarios.

# Characteristic



- Dual protection: omnidirectional bumpers with anti-sink design.
- Intelligent safety: collision avoidance & auto-reverse in shallow water.



- 7" controller: 1080P HD video, 3 km range (unlimited via 4G).
- Remote control endurance: up to 8 hours.

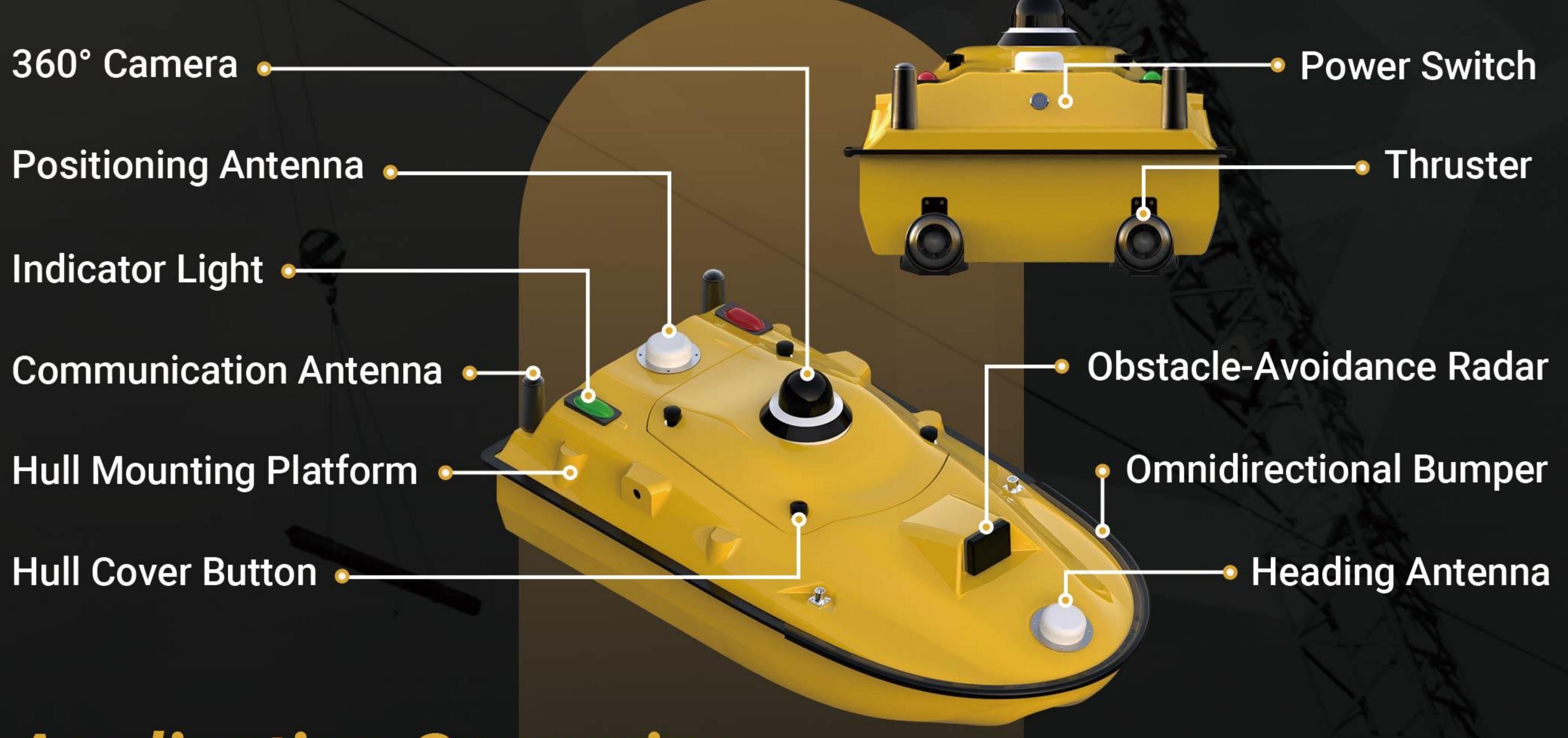


- PPK post-processing with attitude & tidal correction enhances data accuracy.
- AI target recognition improves processing efficiency.



- Plug-and-play propulsion & hot-swappable battery for uninterrupted operation.
- Open interfaces enable flexible payload integration and secondary development.

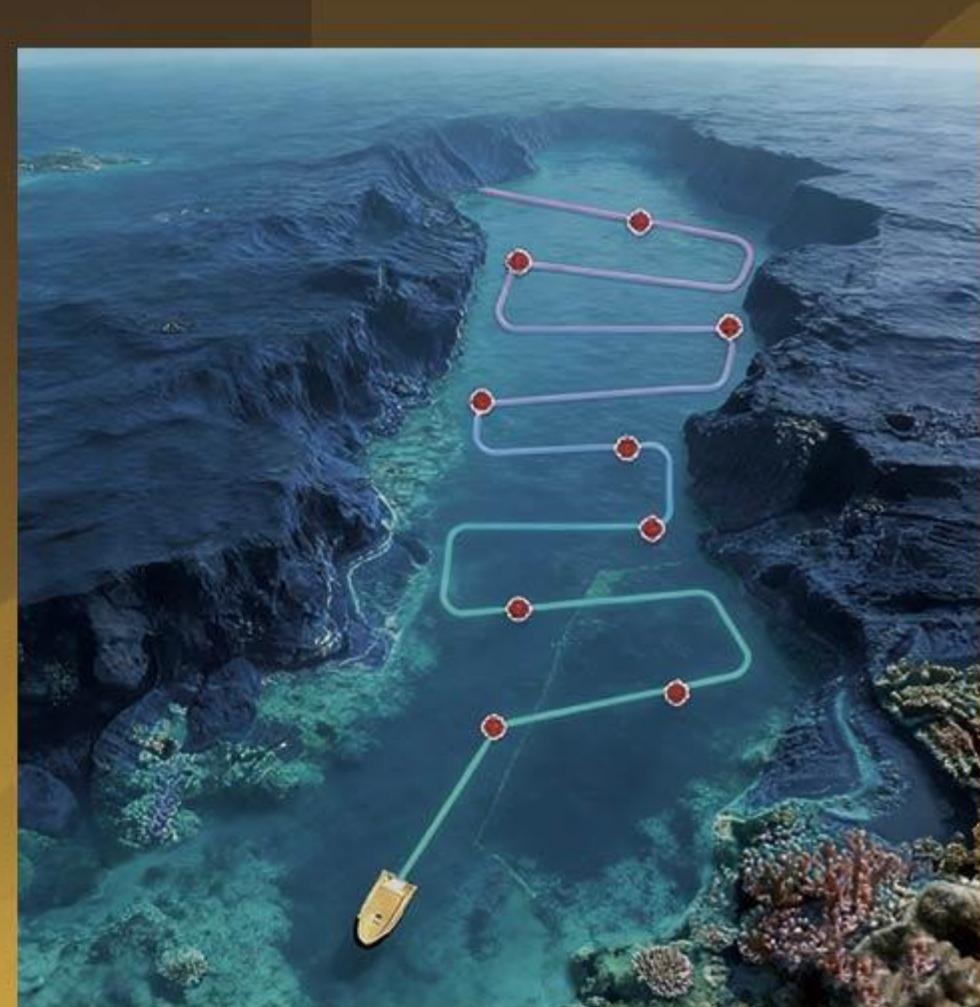
# System Components



# Application Scenarios



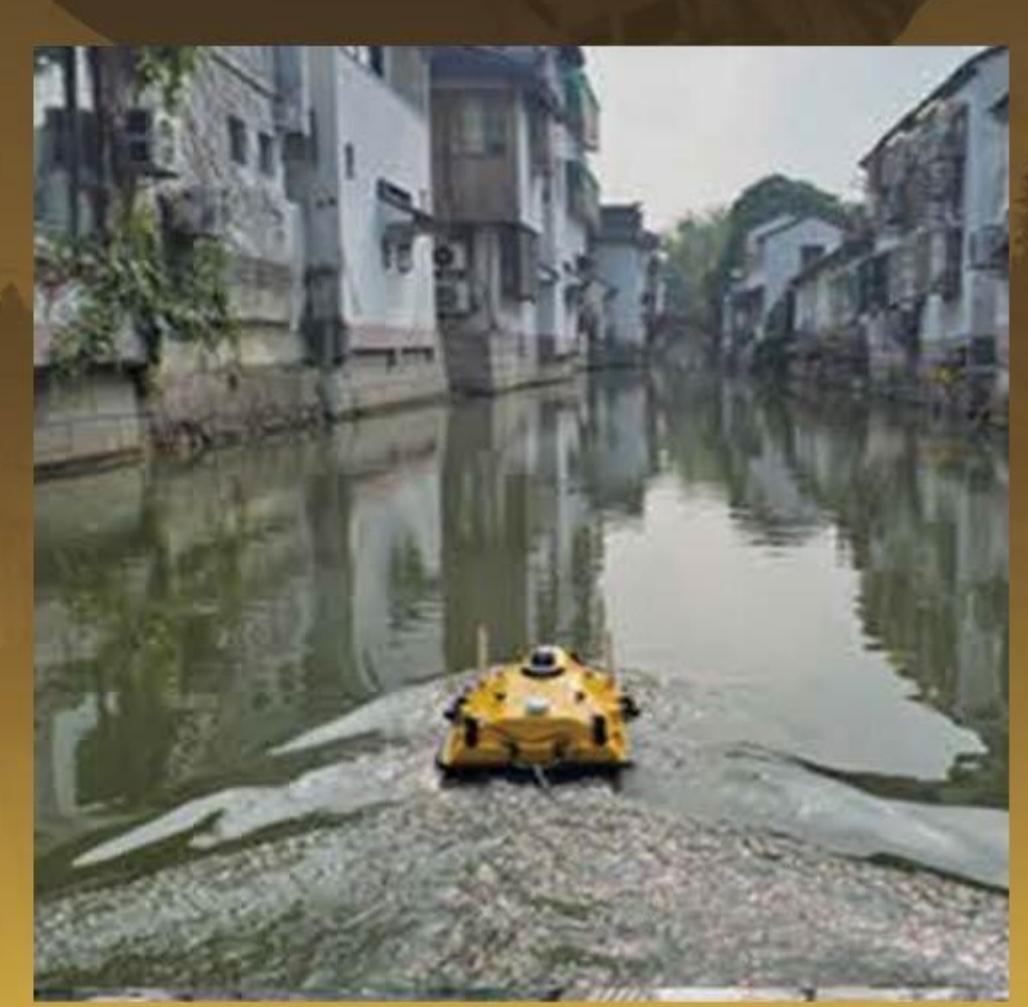
Water Depth Measurement



Water Quality Sampling



Water Quality Monitoring



Surface Inspection

## ITEM

## SPECIFICATION

## REMARKS

## HULL

Hull Dimensions	980 × 520 × 254 mm
Material	High-molecular-weight polyethylene; Kevlar fabric reinforcement
Draft	8.5 cm
Weight	Hull 7 kg; Full system 30 kg (including external modules, controller, and battery)
Maximum Payload	35 kg
Anti-Wave Capability	Level 3 wind waves, Level 2 swell
Ingress Protection	IP67
GNSS	Built-in GNSS positioning, dual-antenna and dual-receiver system
Status Indicator Light	Dual-color LED, indicates remote-control signal and GNSS positioning status
Camera	360° all-round night-vision camera
Obstacle Radar	Beam width: 120° × 120°; Detection range: 0.1–20 m (optional 40 m version)

## POWER SYSTEM

Propulsion Type	Electric
Motor Type	Brushless motor
Steering Mode	Differential steering with dual motors; supports reverse thrust
Rated Power	900 W total motor power
Motor Speed	Rated 5300 RPM
Motor Mounting	Detachable plug-in design; easy to replace
Battery Type	High-capacity lithium battery, 33.6 V 25 Ah (two detachable battery compartments), 21700 cells
Battery Replacement	Supports quick replacement and plug-in/out swapping
Endurance	Approx. 3 hours @ 2.0 m/s; 7 hours @ 1.5 m/s
Range	Range at economical speed: 38km
Maximum Speed	7 m/s; supports stable operation in turbulent water / high-current environments

## REMOTE CONTROLLER

Dimensions	277 × 138 × 96 mm
Display	Industrial touch-screen; sunlight-readable Resolution: 1920 × 1200 Brightness:Up to 1200 nit
Memory	4 GB RAM, 64 GB storage
Frequency	2.400–2.483 GHz
Communication Range	Up to 3 km digital link; unlimited range via 4G
Battery Capacity	20,000 mAh
Operating Time	8 hours
Charging	18 W fast charging; compatible with standard Type-C port
Interfaces	PPM, RJ45, USB, Type-C, SIM card slot, TF card slot

## MAIN CONTROL UNIT

Operating System	Linux
Base Station Communication	Radio (optional) & Network & CORS
Video Communication	4G & 2.4G
SIM Slot	Nano SIM slot
Interfaces	2 × RJ45 ports, 2 × RS232 ports, 2 × RS485 ports

## POSITIONING

Satellite System	Supports BDS (BDS-2: B1I, B2I; BDS-3: B1I, B3I), GPS (L1C/A, L2P, L2C), GLONASS (G1, G2), Galileo (E1, E5b), QZSS* (L1C/A, L2C), SBAS* (L1C/A) and other multi-constellation signals
Cold Start	< 30 s
Initial Fix Time	< 5 s (D≤10 km)
Single-Point Positioning Accuracy	Horizontal: ≤ 3 m; Vertical: ≤ 1.5 m
DGNSS Positioning Accuracy	Horizontal: 40 cm + 1 ppm; Vertical: 80 cm + 1 ppm
RTK Positioning Accuracy	Horizontal: 8 mm + 1 ppm; Vertical: 15 mm + 1 ppm
CORS Source	Supports network CORS
Differential Data Protocols	Supports TT450 protocol, transparent transmission, and other standard formats
Heading Accuracy	Precision: 0.1° (1 m baseline)
Gyro Drift	6°/h, 20 s drift stabilization, supports uninterrupted autonomous navigation
IMU Update Rate	200 Hz

## ECHO SOUNDING

Frequency	200 kHz
Beam Angle	8°
Depth Range	0.15–200 m (extendable for larger range)
Resolution	8 mm
Stability	±2 cm (CEP 95 @ 10 m)
Depth Accuracy	±1 cm + 0.1% × D (D = depth)
Power Supply	9 V–28 V
Sound Speed Range	0 m/s – 1700 m/s
Power Consumption	5–10 W

► Manufacturers may update parameters at any time, please refer to the latest product information.