

# NavMind

New-Generation Navigation System



Focusing on autonomous navigation scenarios  
enhancing the intelligence level of ships  
and empowering the green and safe development of the shipping industry.

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## Highlander Next-Generation Navigation System

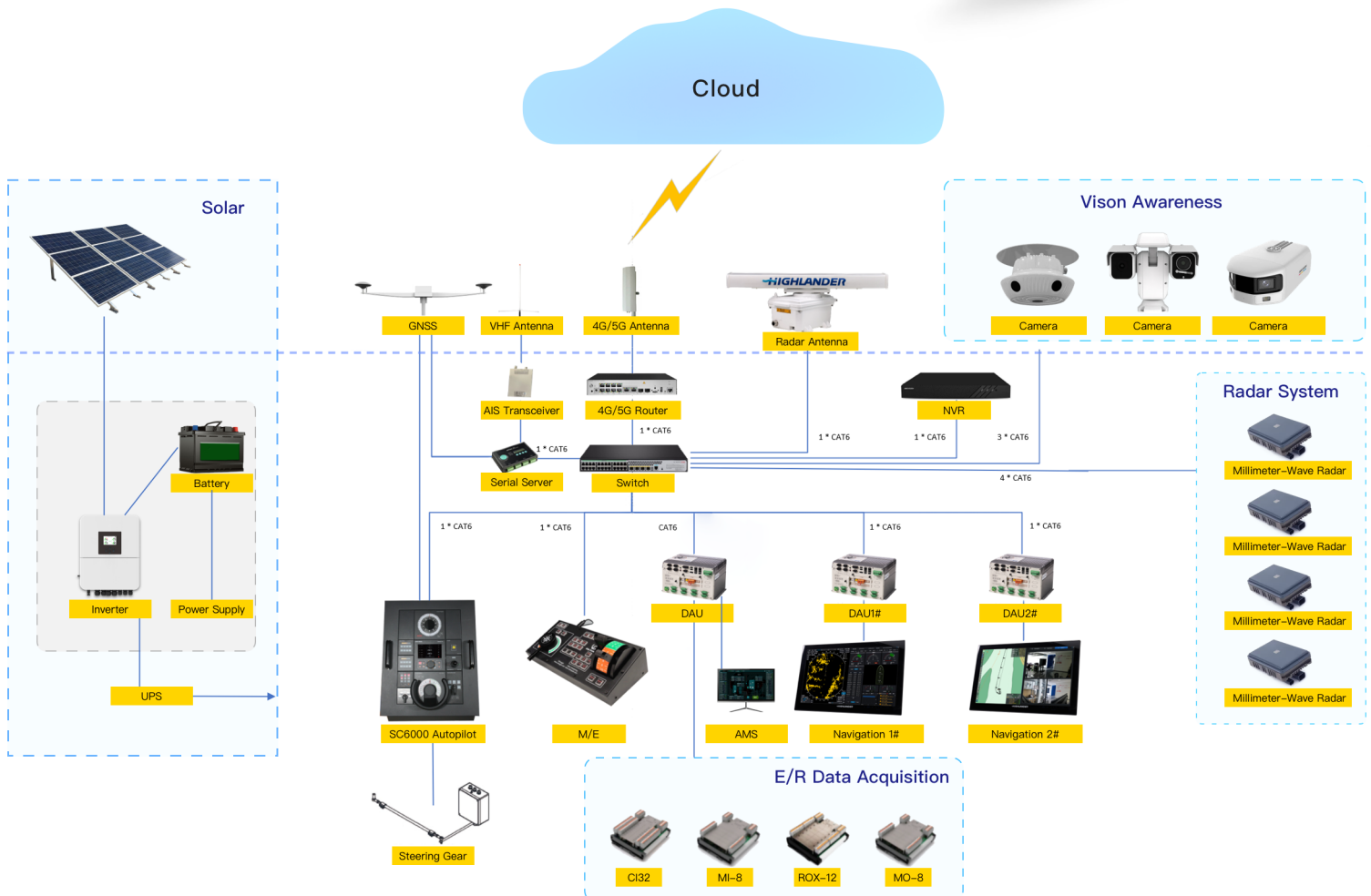
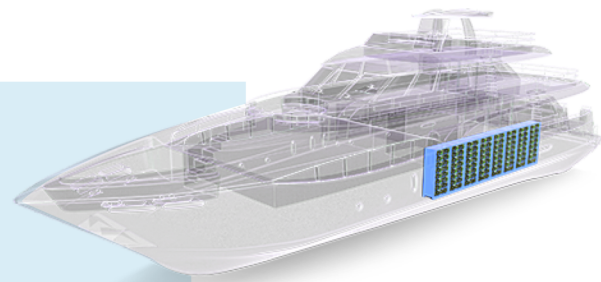
NavMind is a next-generation navigation system for autonomous inland and offshore navigation scenarios. The system integrates multiple types of navigation sensors and relies on AI algorithms to achieve multi-source target integration such as AIS, radar ARPA, and video vision. It integrates intelligent awareness, computing, decision-making, and control.

It provides core functions such as assisted collision avoidance, route warning, tracking driving, route optimization, assisted/automatic docking and unberthing, and remote control. It can integrate and expand energy efficiency and cabin equipment management, AMS, and other functions to improve the four core requirements of "navigation safety, crew efficiency, driving experience and Shipping benefits".

Leveraging an integrated ship-to-shore communication network, the product collaborates with Highlander's shore-based big data and AI computing platform. This synergy establishes a "Shipboard Sensing + Shore-based Processing + Remote Empowerment" system. It provides full lifecycle digital-intelligent services, facilitating intelligent vessel upgrades and enabling greener, safer shipping.

### System Architecture Diagram

Autonomous/Assisted Navigation via Shore-Ship Collaboration.  
Functional Integration via Data Fusion.



## Product Components



NO.	Functional composition	Type	Certification
1	Navigation Radar	HLD-RADAR300/HLD-RADAR900S	✓
2	ECDIS/ECS	HLD-ECS100	✓
3	GNSS Compass	HLD-BSC100	✓
4	Autopilot	HLD-SC600	✓
5	Vison	HLD-EL600	
6	Intelligent Navigation System	HLD-SNS600	Intelligent Navigation <b>N</b>
7	Intelligent Engine Room System	HLD-SMS600	Intelligent Engine Room <b>M</b>
8	Intelligent Energy Efficiency System	HLD-SES600	Intelligent Energy Efficiency <b>E</b>
9	Intelligent Integrated Platform	HLD-DIP600	Intelligent Integrated Platform <b>I</b>
10	AMS	/	✓
11	Shore-based System	/	



## Technical Specifications

Radar: Same as HLD900/900S Series Radar

No.	Key Metric	Technical Parameters
1	Peak Power	Magnetron: 6/10/25/30kw; Solid-State: 200/250/300w
2	Antenna Length	6/8/12ft
3	Polarization	Polarization
4	Frequency Band	3050±30; 39410±30MHz
5	Azimuth Resolution	1.3/1/2°
6	Range Resolution	Better than 20m
7	Range	Support 0.125、0.25、0.5、0.75、1.5、3.0、6.0、12.0、24、48、96NM
8	ARPA Target Count	≥100
9	AIS Active Target	≥100
10	AIS Target	≥500
11	Power Supply	AC220V、50Hz
12	Power Consumption	<300w

ECDIS: Same as ECDIS1000/ECS100

No.	Key Metric	Technical Parameters
1	ARPA Targets	≥100
2	AIS Active Targets	≥100
3	AIS Targets	≥500
4	Information Update Cycle	1s
5	Power Supply	AC220V、50Hz
6	Power Consumption	<200w

Vison Awareness

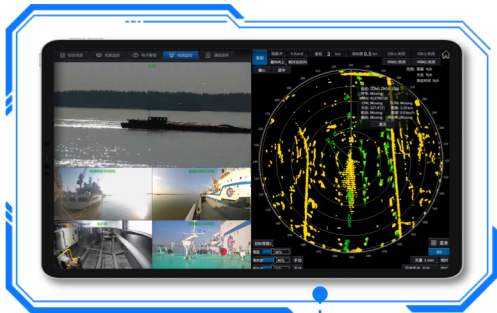
No.	Key Metric	Technical Parameters
1	Surveillance Range	0 ~ 5000 m
2	Electron telescope	With visibility 5000 meters condition, the maximum detection for visible light is 3000 meters and the maximum detection for infrared is 1500 meters.
3	Enhanced Night Navigation	With visibility 5,000 meters condition, visible light at night can see the outline of the navigation mark within 1,000 meters; infrared can detect ships at a distance of 5,000 meters.
4	Enhanced Fog Navigation	Visibility≥800 meters, infrared light can detect the navigation mark profile within 1000 meters
5	Range Rings	Supports ship-side 50/100/200m (configurable) equidistant line overlay display; Error: ≤ 5 m (within 100 m range) ; Error: ≤ 10 m (within 200 meters)

## Navigation Sensor

No.	Key Metric	Technical Parameters
1	Heading Accuracy	0.2°RMS
2	Position Accuracy	1.5 m
3	SOG Accuracy	0.03 m/s
4	Setting Time	<1 min.
5	AIS Output Power	Class B: 2 W; Class A: 12.5 W (High) / 1 W (Low)
6	AIS Receiver Sensitivity	Class B: Better than -110 dBm; Class A: Better than -107 dBm
7	Echosounder Accuracy	200 kHz: 1% of full scale; 50 kHz: 2.5% of full scale
8	Speed Log Accuracy	0.2 knots or 2%, whichever is greater
9	Distance Log Accuracy	0.2 nautical miles or 2%, whichever is greater

## Ship-Shore Communication

No.	Key Metric	Technical Parameters
1	4G/5G Communication	Supports both IoT SIM cards and standard mobile data SIM cards.
2	LAN Interface	Supports the IEEE 802.11b/g/n standard.
3	Communication Rate	The maximum data rate reaches 50 Mbps (uplink) / 100 Mbps (downlink).



Strive to be a global leader in intelligent maritime navigation and an innovative practitioner of China's smart ocean development.

## Use Cases

It has been applied to ships in the waters of the Yangtze River main line, Hefei–Yuxikou line, and Xijiang–Pearl River line, and has fully demonstrated the practical value of route guidance, low visibility awareness enhancement, navigation assistance, and navigation in inland river without ECDIS data and seasonal changing waters.

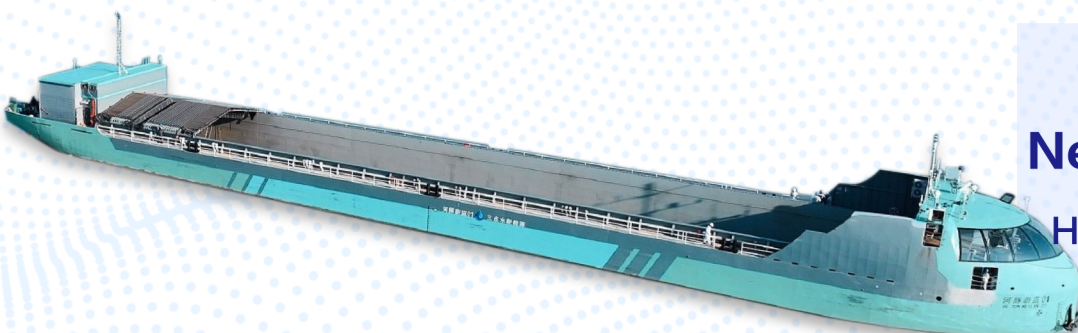


**75000 ton**  
CH Huoyun 005

**5000 ton LNG**  
Beigangjianghe01



**3000 ton**  
**New energy ship**  
HE TUN WEI LAN 01



## Three Savings & One Intelligence

Add intelligent functions to the mandatory equipment of ships, with almost no additional equipment, to achieve autonomous navigation. This solution supports the construction of ships and new ships, significantly reducing the demand for ship equipment and cables; saving equipment, space and costs. Especially suitable for ships with small wheelhouse space, fewer drivers and fast task switching: including high-speed business ships, tugboats, inland and coastal merchant ships.

## Construction Value

### Equipment

60% Reduced number of devices

### Space

40% reduction in installation space

### Cost

50% reduction in equipment costs

Solution 1

2 workstations

Solution 2

3 workstations

Traditional Solution

5 workstations

## Operational Value



Wuhan-Yichang  
Navigation Section

Nanning-Wuzhou  
Navigation Section

With intelligence as the foundation and end-cloud integration, we strive to build an autonomous navigation capability that progresses layer by layer of data-information-intelligence, and form four core values “alternative Work, Improving Safety, enhancing Efficiency, and increasing Benefits”.



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