HIGHLANDER 海兰信

Solid State Navigation RADAR

HLD-RADAR 900S

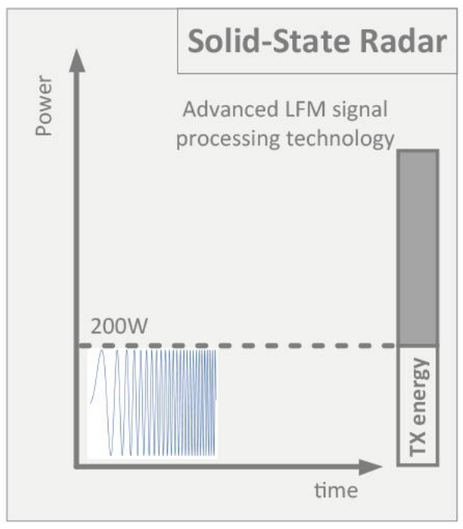
FULLY AUTOMATIC WORKING RADAR AUXILIARY COLLISION AVOIDANCE RADAR

Compliance with the Following Normative Standards:

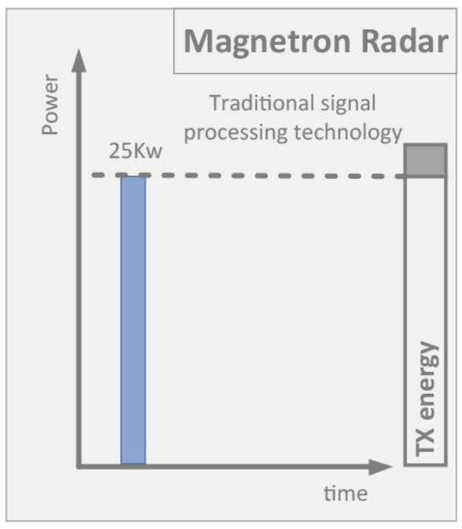
IEC 60945(2002)incl.Corrigendum 1 (2008) IEC 61162-2(2024)
IEC 61162-1(2024) IEC 61162-450(2018) IEC 62288(2021) IACS UR E27 (Rev.1)
IEC 62923-1(2018) IEC 62923-2(2018) IEC 62388:(2013)/COR1:2014

Longer Detection Range

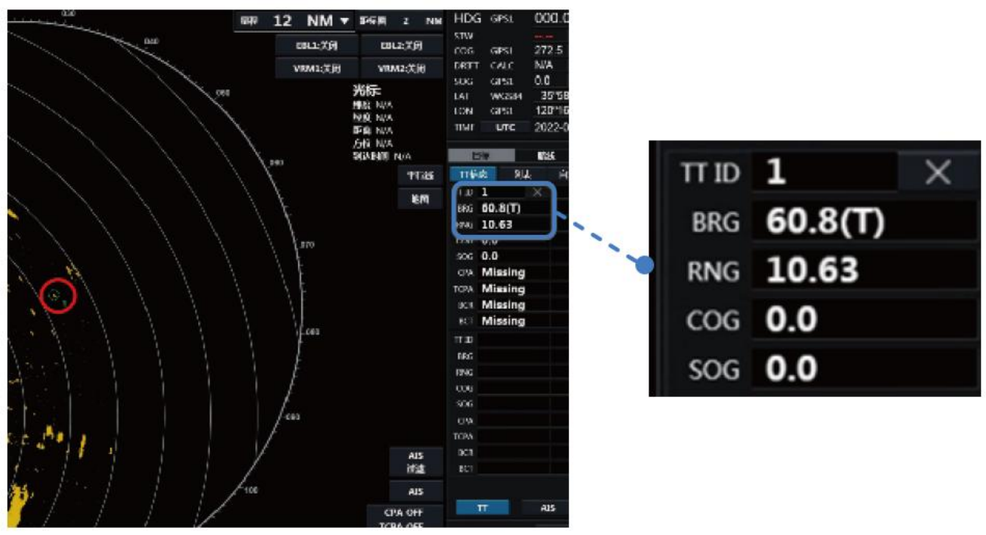
The solid-state radar adopts low-power transmission, large signal bandwidth and pulse compression technology. The new signal form and processing architecture greatly improve the target detection capability, especially the capability to detect long-range targets. It can achieve more than the detection power of traditional radar with only 1/100 of the transmission power.



Low power, long pulses



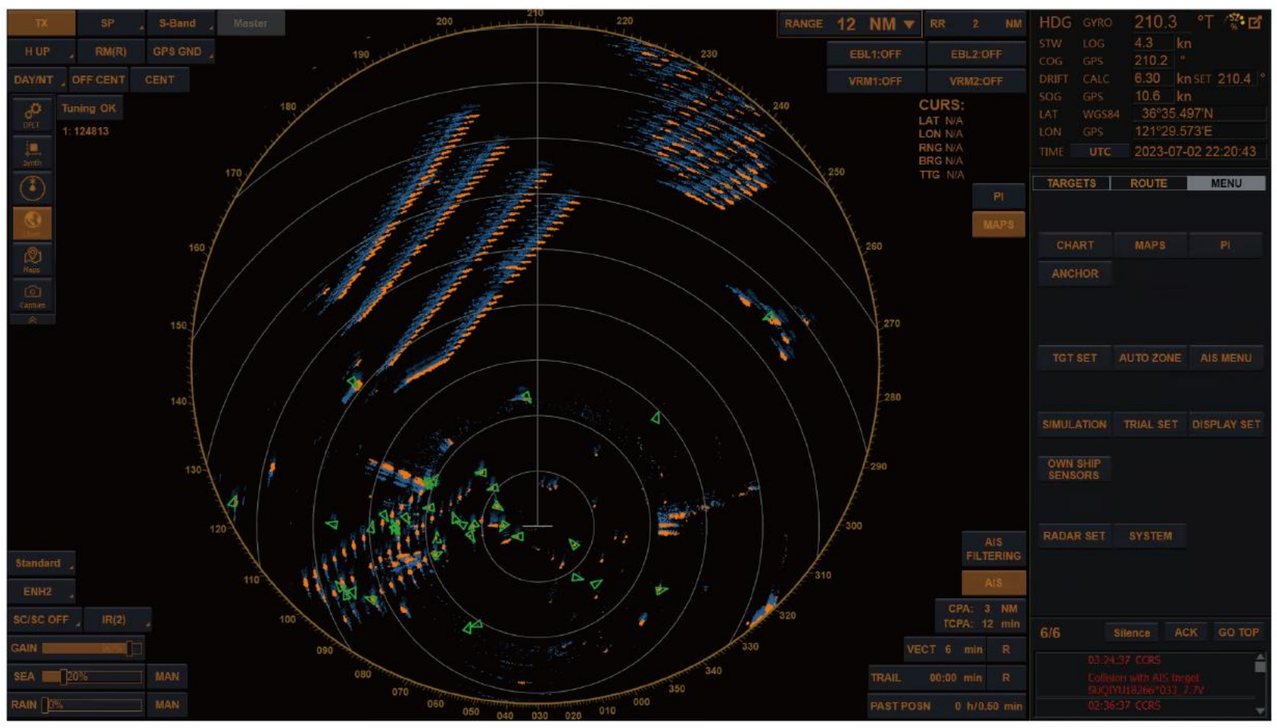
High power, short pulses



Detection range of a standard 10m² sphere at X-band (IMO standard 4.9NM)

Higher Distance Resolution

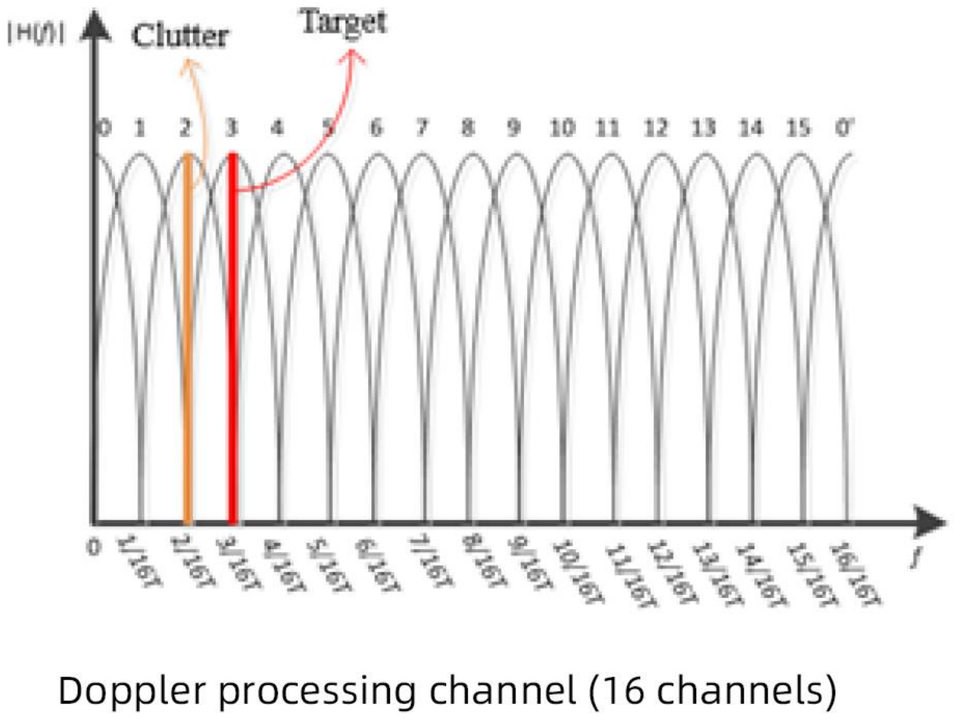
The solid-state radar achieves narrower equivalent pulse width through pulse compression technology, improving distance resolution and resolving the contradiction between traditional radar's distance resolution and long-range detection capability.



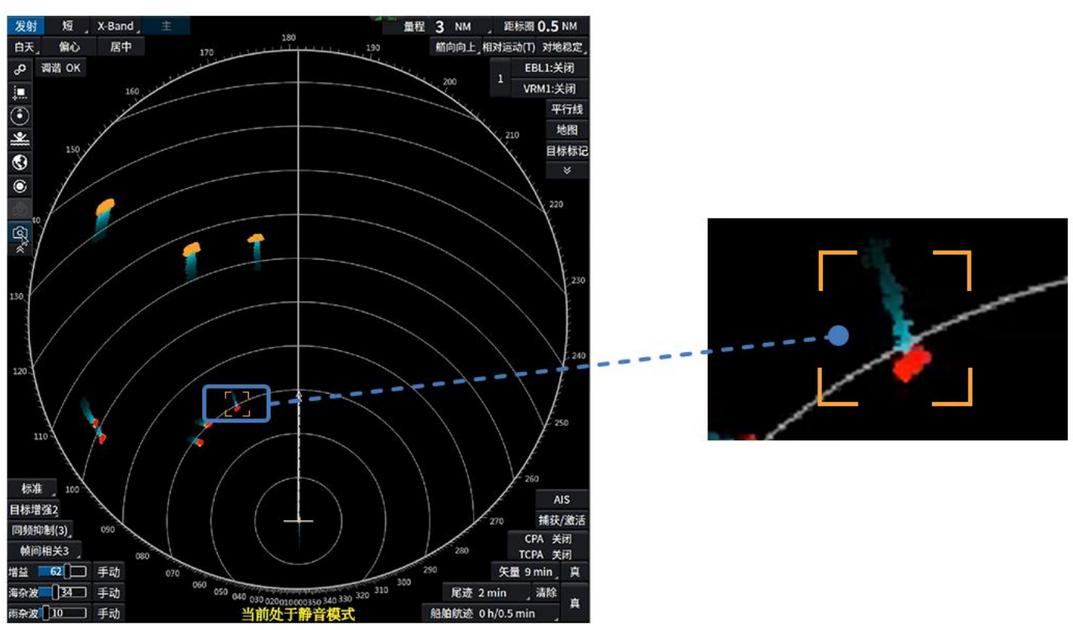
Schematic diagram of target detection in offshore wind farms and aquaculture area ("Dolphin" solid-state X-band radar, July 2023)

Faster target early warning capability

The solid-state radar adopts Doppler processing technology to calculate target speeds in real time, marks dangerous targets approaching the ship in red, and achieves more rapid target early warning.



Doppler processing channel (16 channels)



Marking function for approaching dangerous targets

High Reliability, Easy Maintenance

High Reliability: Gallium Nitride (GaN) amplifier module,Low Life-cycle Cost.
Easy Maintenance: Modular design integrating frequency conversion and digital functions.
Operational Safety: Low-voltage system design for enhanced safety.

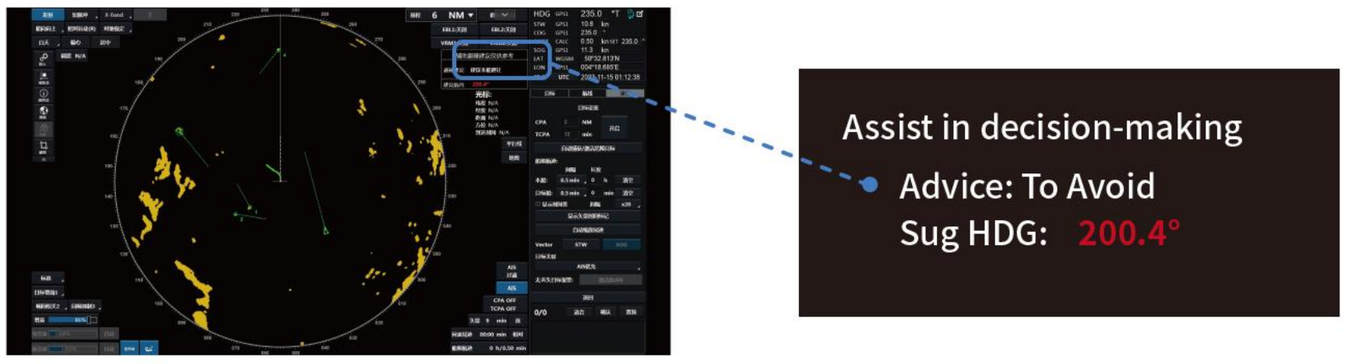
GaN Amplifier Module

Frequency Converter Module

Digital Baseband Module

Intelligent Collision Avoidance Assistance

The solid-state radar integrates Doppler technology, target plotting, AIS (Automatic Identification System) and other technologies to achieve accurate perception of target dynamic information such as position, speed and bearing. Its intelligent collision avoidance algorithm processes and evaluates the target dynamic information, predicts potential collision risks, and provides reasonable operational recommendations.



Radar Health Management

Real-Time Monitoring: Built-in Test Equipment (BITE) tracks system status via visual interface.
Fault Management: Auto-alarm with location pinpointing, severity indication, and maintenance guidance.
Mobile Reporting: QR code scanning enables quick fault reporting through mobile devices.
Cloud Maintenance: Automated data synchronization generates maintenance plans to ensure reliability.

Enhanced anti-interference capability

The solid-state radar adopts a variety of advanced technologies such as fully coherent pulse compression processing, superheterodyne reception, and pulse repetition frequency (PRF) dithering, boasting stronger anti-co-channel interference capability. It can maintain stable operation more effectively, especially under complex electromagnetic environment conditions.

No tuning, No preheating

Solid-state radar has stable signal frequency and is capable of precise frequency control without the need for tuning. Solid-state radar is ready to use immediately, without the need for preheating.

HLD-RADAR 900S-X(X-BAND) Series Configuration

Standard	
Antenna	HLD-AT104/106/108
Transceiver Unit	HLD-TU220/230
Display Unit	HLD-DU133/134/138 HLD-DU162/163/165
Random Cable	HLD-NIK
HMI Unit	HLD-IU600/HLD-IU600R
Main Control Unit	HLD-MCU770S
Power Conversion Unit	HLD-PCU600

Optional	
1	ECDIS key HLD-LIC900
2	Console (shading plate)
3	Tabletop stand
4	De-icing device HLD-DH900-X

HLD-RADAR 900S-S(S-BAND) Series Configuration

Standard	
Antenna	HLD-AT112
Transceiver Unit	HLD-TU225
Display Unit	HLD-DU133/134/138 HLD-DU162/163/165
Random Cable	HLD-NIK
HMI Unit	HLD-IU600/HLD-IU600R
Main Control Unit	HLD-MCU770S
Power Conversion Unit	HLD-PCU600

Optional	
1	ECDIS key HLD-LIC900
2	Console (shading plate)
3	Tabletop stand
4	De-icing device HLD-DH900-S

*The specific configuration is subject to the type approval certificate.

Dimensional Drawings

【Power conversion unit HLD-PCU600】4kg

【Human machine interaction unit HLD-IU600】3kg

【Display unit 24" HLD-DU163】10kg

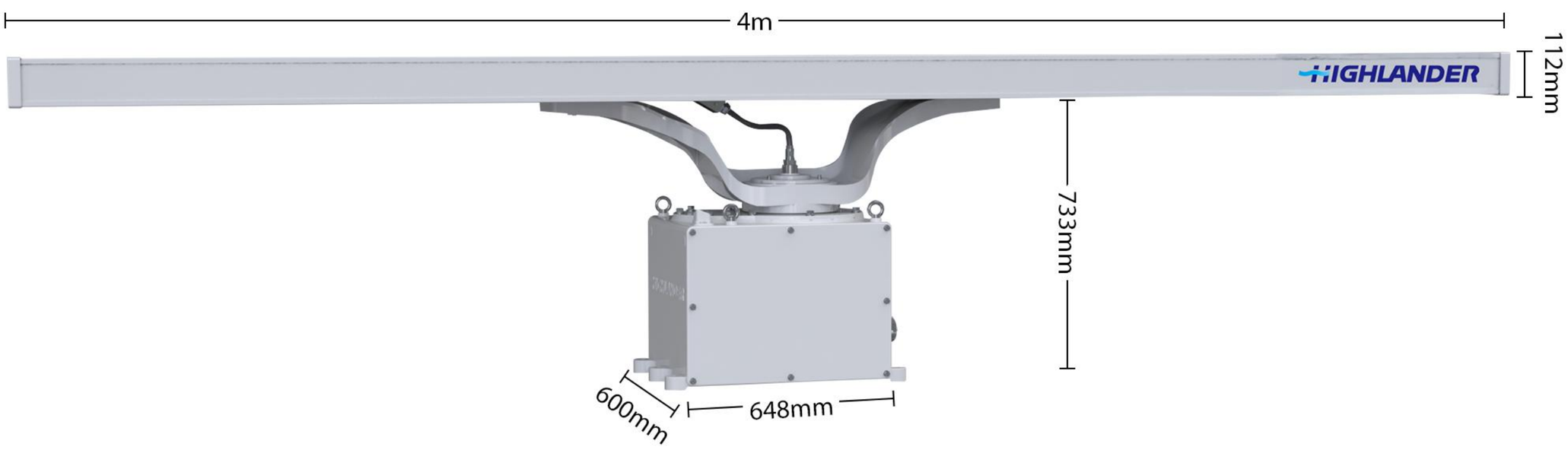
【Main control unit HLD-MCU770】6kg

Name	Specifications	Length mm	Depth mm	Height mm	Weight kg	Specifications	Length mm	Depth mm	Height mm	Weight kg
Display unit 19”	HLD-DU162	429	69	382	7	HLD-DU133	429	75	382	8
Display unit 24”	HLD-DU163	605	69	397	10	HLD-DU134	593	70	384	11
Display unit 27”	HLD-DU165	650	70	420	11	HLD-DU138	650	70	437	11

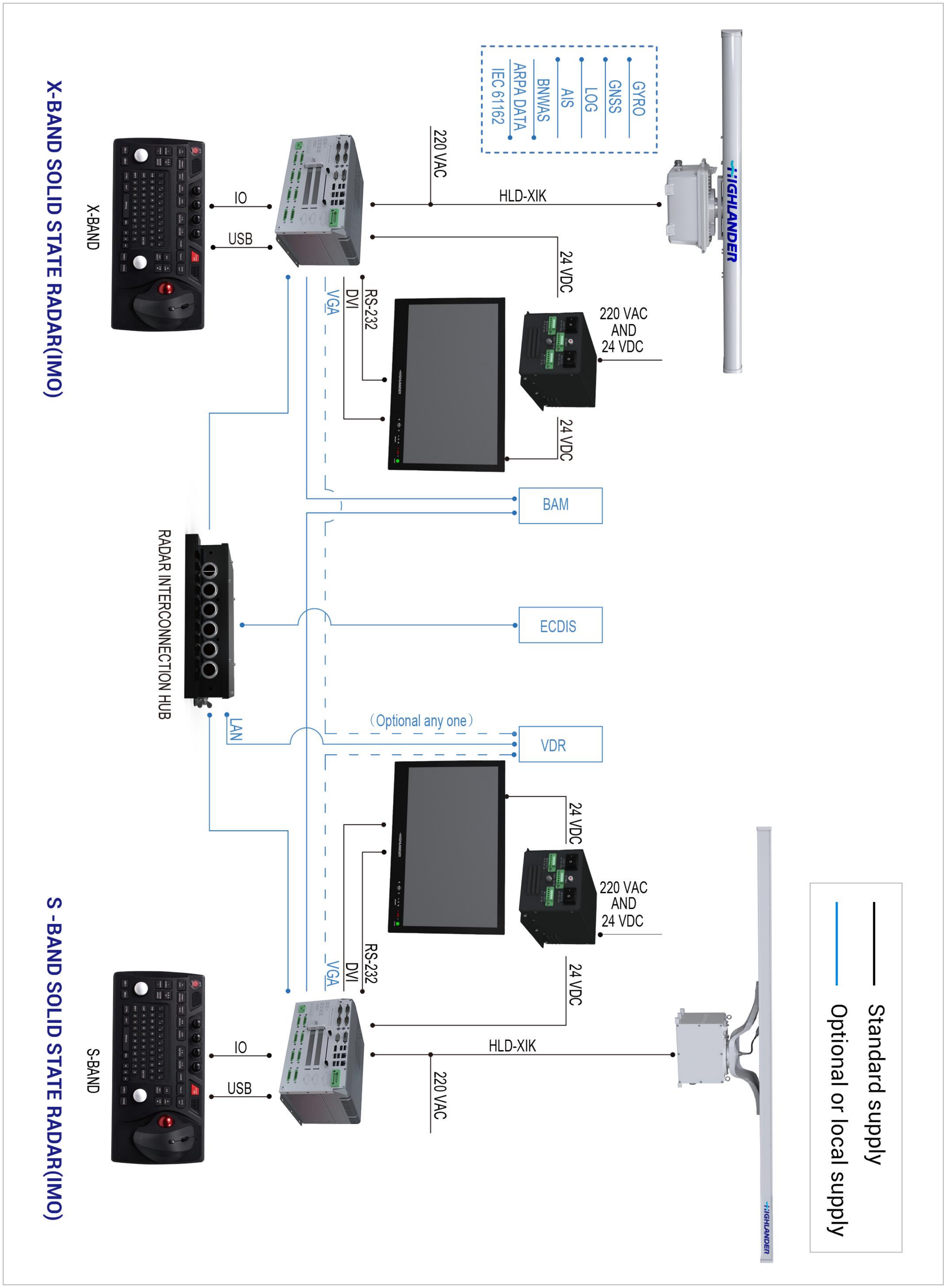
【HLD-AT108+TU230 X-band radar】43kg

Antenna	Specifications	Length m	Weight kg
4ft	HLD-AT104	1.36	5
6ft	HLD-AT106	2.05	7
8ft	HLD-AT108	2.54	9
12ft	HLD-AT112	4	66

【HLD-AT112+TU225 S-band radar】186kg



X-BAND+S-BAND System Connection Diagram



Technical Specifications

Antenna band		X-Band			S-Band
		HLD-AT104{1}	HLD-AT106{2}	HLD-AT108{2}	HLD-AT112{2}
Length (ft)		4	6	8	12
Peak transmit power（W）		200{3}/300{4}			250{4}
Radiation Safety Distance (Peak)		1.68m	1.55m	1.32m{5}	1.63m
Beam Width	Horizontal（°）	2	1.3	1	2
	Vertical（°）	22±2°			
Polarization mode		Horizontal			
Antenna rotation speed		24rpm or 44rpm（Supports customization）			
Operating frequency(MHz)		9300±100			3000±100
Mode and repetition rate	Short pulse groups	0.05μs/10μs/40μs ,1700~2000Hz			
	Medium pulse groups	0.16μs/10μs/40μs ,1200~1500Hz			
	Long pulse groups	0.3μs/10μs/70μs ,600~900Hz			
Clutter suppression	Sea clutter	Manual/Automatic			
	Rain and snow clutter	Manual/Automatic			
whether to preheat during boot		No need			
Mean time between failures of transceiver units （MTBF, hr）		100000			
Mean time to repair of transceiver unit (MTTR, hr)		0.5			
Maximum detection distance (nm, 10 square standard balls)		8.9	9.2	10.6	7.5
Range resolution（m）		15			17*
Azimuth resolution（°）		2.0**	1.5**	1	1.8*
Display resolution (19/24/27 inches)		1280×1024 / 1920×1080 / 1920×1080			
Display mode	Motion mode	True motion, relative motion			
	Direction mode	Bow up, true north up, course up, stern up			
Display range (nautical miles/kilometer)		0.125-96			
Language selection		Chinese/English/Customization supported			
ARPA target capture		Up to 100			
Automatic target capture		Support, 2 auto-capture zones			
AIS target activity		Up to 100			
AIS/ARPA target associations		Support			
High-speed dangerous target recognition		Support			
Test maneuver ship		Support			
Chart radar function		Optional			

*Actual measurement results witnessed by certification engineer **Actual measurement results witnessed by CCS certification engineer {1}Products that obtained S and comply with international standards {2}Products that obtained CCS&DN and comply with international standards {3}products that meet the standards of inland navigation {4}products that meet international navigation standards {5} The radiation safety distance of the magnetron is 4.03 meters

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