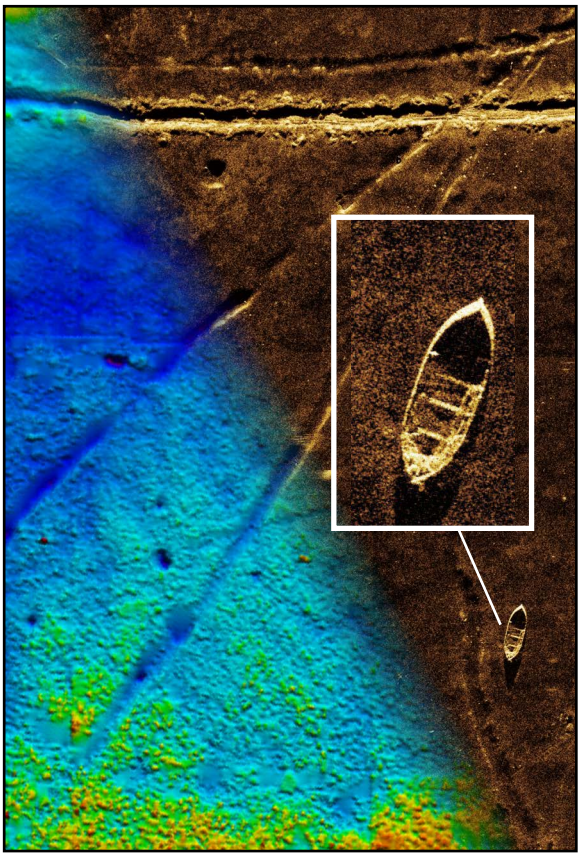
KATFISH™

Survey Smarter

Kraken's Active Towfish KATFISH™ is based on our proven next-generation Miniature Interferometric Synthetic Aperture Sonar (MINSAS) providing the industry's best area coverage rates combined with ultra-high-resolution seabed imagery and 3D bathymetry.

The KATFISH™ system comprises of an actively-controlled intelligent towfish, SAS imaging, bathymetry and gap-filler sonars, launch and recovery system, operator console, and visualization/image processing software. The entire system is designed for quick installation and removal from vessels of opportunity such as manned or unmanned surface vehicles.



Anchor scours and dory in Bedford Basin, Halifax, Nova Scotia

At the heart of the KATFISH™ system is the 180 cm AquaPix® MINSAS sensor arrays (3 x 60 cm arrays make up the 180 cm) which provide remarkably sharp 3.3 cm x 3.0 cm constant resolution across ranges up to 200 meters per side. With tow speeds up to 10 knots and an integral gap-filler, KATFISH™ provides unprecedented high-resolution Area Coverage Rates (ACR) of 4 km^2/hr.

KATFISH™ incorporates Kraken's latest generation Real-Time SAS processor, the RTSAS GPU. RTSAS enables real-time processing of SAS imagery and bathymetry, and allows operators to leverage Kraken's suite of post-processing tools, including the newly developed SASVIEW 3D visualization and sonar control software.

From the very beginning, the engineers at Kraken set out to design a towfish with unparalleled resolution and coverage rates to challenge the industry to rethink how hydrographic, pipeline, and mine countermeasure surveys should be conducted. Providing SAS capability and performance at an affordable cost has truly elevated KATFISH™ into a league of its own.

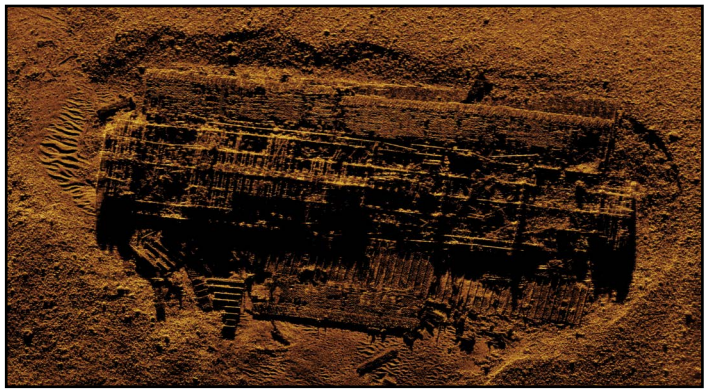
KATFISH™

KATFISH™ 180 - Performance Characteristics

Ground Speed	4 - 10 kn
Dual Sided Max Swath	>270 m at 8 kn (>440 m at 4 kn)
Single Sided Max Plan Range	>135 m at 8 kn (>220 m at 4 kn)
Survey Altitude	min 5 m, max 30 m
Along Track SAS Image resolution	3.3 cm
Across Track SAS Image resolution	3.0 cm
SAS Image Grating Lobe Level	-40 dB
SAS Bathy Resolution - Real-Time	25 cm x 25 cm
SAS Bathy Resolution - Post Proc.	6 cm x 6 cm
SAS Bathy Vertical Accuracy	10 cm
Nadir gap Coverage	Acoustic and Laser
Pulse Length	configurable 1 ms -> 10 ms
Pulse Bandwidth	40 kHz
Pulse Type	Linear FM (CHIRP)
Pulse Center Frequency	337 kHz
SAS Robustness Against Yaw	±10° over 50 m track length
SAS Robustness Against Sway	±0.2 m/s
Max Crab Angle	20°

KATFISH™ 180 - Physical Characteristics

Towfish Dimensions	2.9 m length x 0.318 m ext. diameter
Towfish Wingspan	1.20 m
Towfish Weight in Air	195 kg
Array Dimensions	180 cm x 7 cm
Operational Depth Rating	300 m (cable length limited)
Obstacle Avoidance Sonar	Standard
Nadir-gap Filling Multibeam (MBES)	Standard
Emergency Locator Beacon	Standard
DVL aided INS	Standard
Standard accuracy USBL	Included for Standard Accuracy
High Accuracy USBL	Optional for High Accuracy
Kraken Tentacle Winch™	Optional

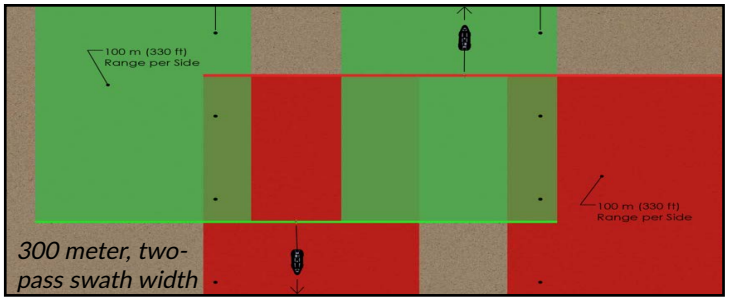


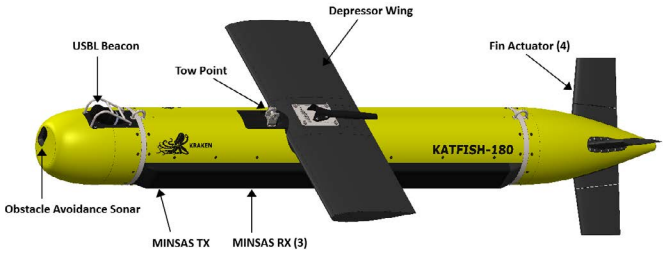
KATFISH™ 180 - System Topside Components

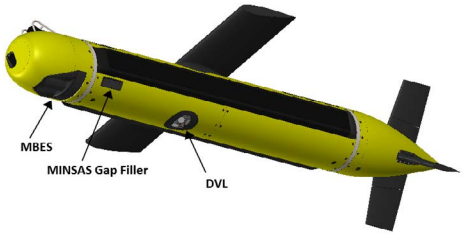
Rackmount Case Size	4 x 6U standard
HDD Capacity	36 Tbyte standard, enough for 100 hours of RAW and beamformed SAS data
Data Format	Kraken .TIL, .XTF, GeoTIFF, XYZ
Dual Sided Data Rate, 192 Channels Total	72 MB/s
Towfish Data Connection	Dual fully-redundant fiber. Single Mode
Topside Data Connection	Gigabit ethernet
SAS Processing	Real-time on GPU
Power Supply	120/240 VAC, 50-60 Hz, 2500 W Peak (not including winch) Typical power draw 1540 W

KATFISH™ 180 - Area Coverage

Knots	m/s	Range m (per side)	ACR w/o Gap-Filler km²/hr	ACR w/ Gap-Filler km²/hr
4.00	**2.06**	220	2.28	3.26
5.00	**2.57**	220	2.85	4.07
6.00	**3.09**	183	2.84	4.06
7.00	**3.60**	156	2.82	4.04
8.00	**4.12**	135	2.81	4.01
9.00	**4.63**	119	2.79	3.98
10.00	**5.14**	107	2.77	3.95







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