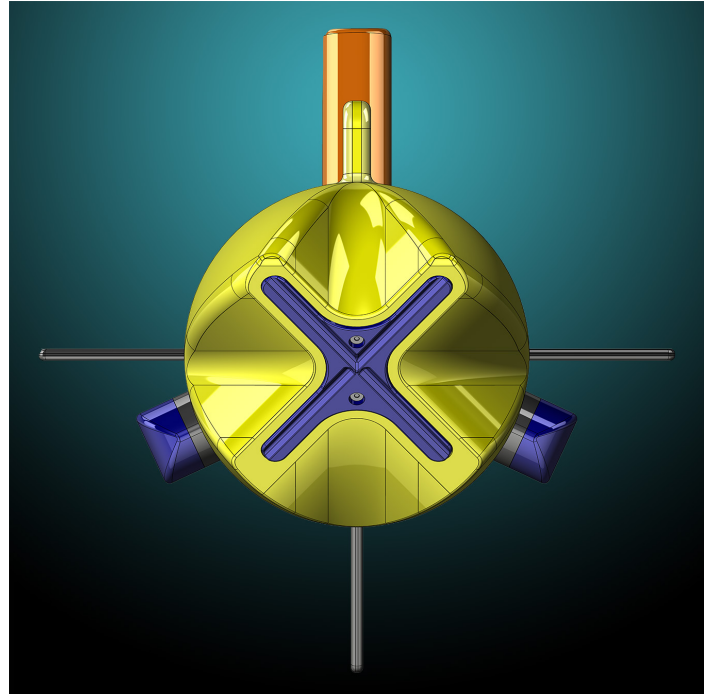




The new Klein AUV-MAKO is the next generation Integrated Sonar Payload for small and medium sized Autonomous Underwater Vehicles (AUVs) and Remote Operated Vehicles (ROVs).

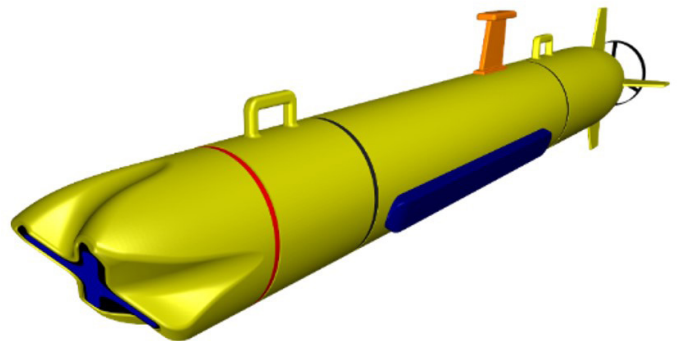
Multiple sensors, integrated with a shared processing engine, provide unique capabilities in a single compact, low-power package.

- Focused Sidescan provides “SAS grade” image quality
- Patented Angle Look Sonar (ALS) technology gives true gap-filling capability for a >40% increase in survey efficiency, high contrast across the entire swath, and in-stride multi-aspect view



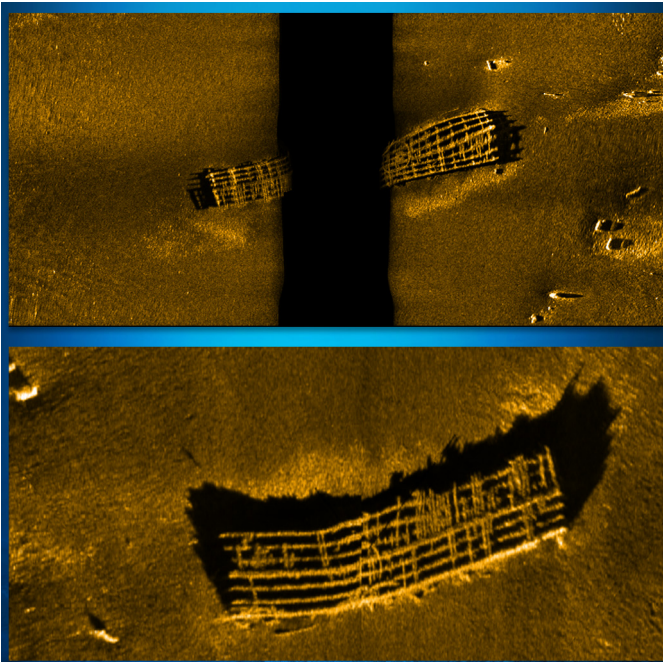
Applications:

- Mine Counter Measure (MCM)
- Intelligence, Surveillance and Reconnaissance (ISR)
- Rapid Environmental Assessment (REA)



Key Features:

- True Full-Swath Coverage
- Integrated Sidescan, Gap-filler and Short-Range Hazard and Terrain Avoidance
- Compact Low Power Design
- Compatible with all Leading Vehicles
- Designed for In-Service Capability Upgrades



*Submerged Bridge
(Klein MAKO Focused Sidescan and MA-X Gap Filler)*

The Difference Is In The Image

KLEIN AUV-MAKO BLOCK 1



HIGH-RESOLUTION INTEGRATED SONAR SYSTEM FOR AUV, UUV & ROV

Designed for P3I:

Pre-Planned Product Improvement (P3I) is the core principle of the AUV-MAKO design.

- Delivers Continual Improvements and Upgrades
- Provides Additional Capability with Minimal or No Additional Integration Effort
- System Functionality Evolve to Meet Changing Requirements and Threats
- Increases System Lifespan

Block Functionality Roadmap*:

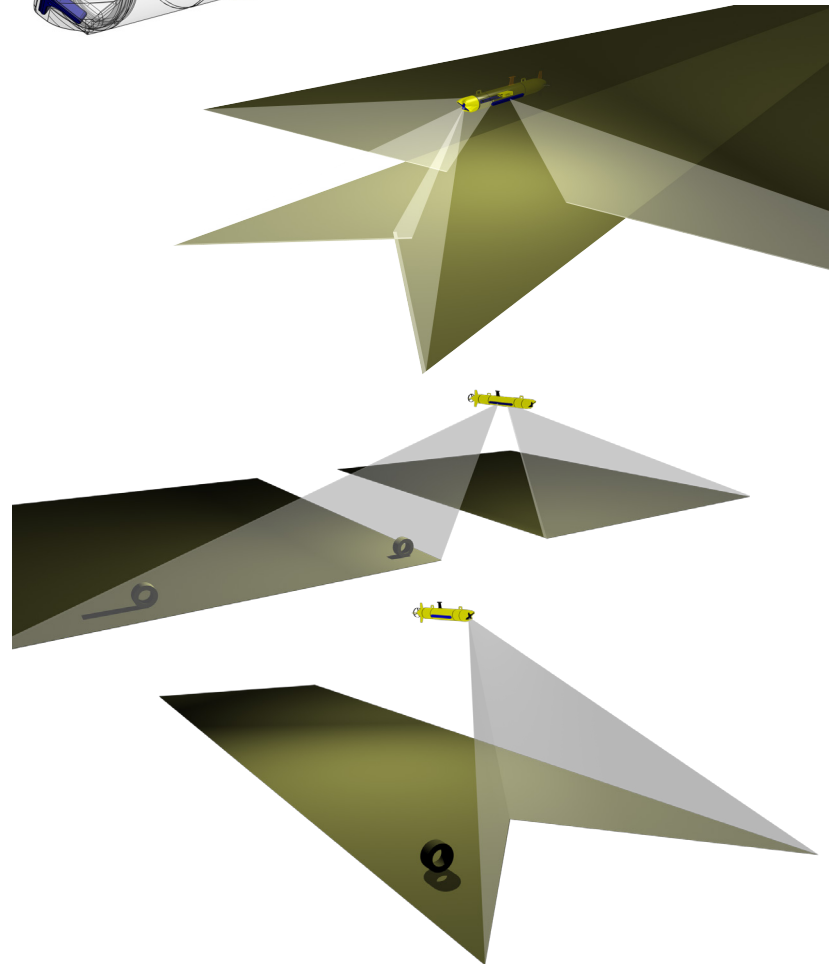
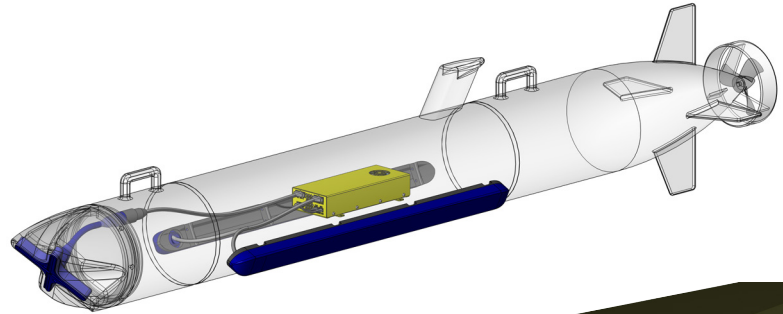
Block 2: Integrated IHO-Standard Bathymetry

Block 3: Multiple/Additional Sidescan Frequencies (incl. >1MHz Acoustic Identification Mode)

Block 4: Onboard Automatic Target Recognition

Block 5: Long-Range Hazard and Terrain Avoidance

Block 6: Full-Domain ATR



System General Specifications (Block 1)

Depth Rating	1000m
Input Voltage	18-29 VDC operating, 32 V charging
Power Consumption	<20 W (7-8 W in standby)
Operating Temperature	0° C to 38° C (in water)
Communications	Ethernet, Serial Trigger in/out
Input Data	NMEA-0183
Output Data Format	Klein SDF or XTF or Both (selectable)
Onboard Sensors	Attitude, Internal Temperature

Sidescan Sonar Specifications

Frequency	600kHz
Range (Per Side)	120 m Max
Pulse Type	FM CHIRP
Horizontal Beamwidth	0.23°
Vertical Beamwidth	40°
Across Track Resolution	2.4 cm
Vertical Beam Center	Tilted down 25° from horizontal

Gap-Filler Sonar Specifications

Frequency	850 kHz (nominal)
Pulse Type	FM CHIRP
Horizontal Beamwidth	0.5°
Range Resolution	2.4 cm
Range (Per Side)	12.5 m (altitude dependent)

Combined Sidescan and Gap-Filler imagery provides full contrast imagery across the entire swath and In-Stride Multi-Aspect data

*Order/Functionality of Blocks is subject to change

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