

ISIIS BoxKite XG – GEN III

REMOTELY OPERATED TOWED VEHICLES

ISIIS BoxKite XG is a third generation Remotely Operated Towed Vehicle (ROTV) designed to be operated from a surface ship with a high bandwidth fiber-optic winch/tow cable. Deployed from a wide range of traditional vessels, ISIIS BoxKite enables to conduct a broad spectrum of surveys with multi-sensor operations (bathymetric, geophysical, magnetics and biological survey operations). Bellamare’s ROTV technology is rooted in high performance/high reliability motion control and an efficient footprint for a maximum array of instruments, from sonars (side scan or multibeam) to magnetometers, cameras, and many more. The ISIIS design offers an unprecedented data stream of 5 Gigabits/sec to collect the data in real time and offer unique data acquisition strategies to ensure full and unbroken survey coverage in a single pass, even with difficult surface conditions.



APPLICATIONS

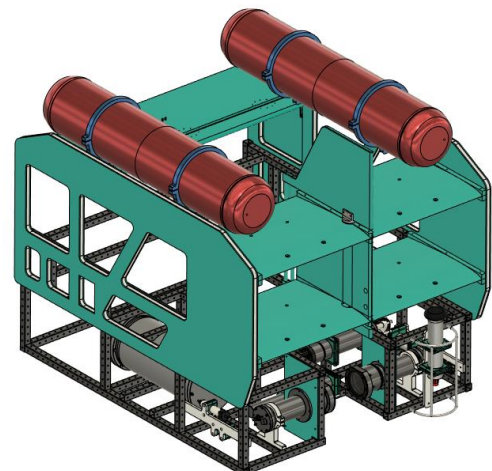
- Hydrographic and Geophysics
- Ocean science and archeology
- Oceanography
- UXO and Wreck detection
- Cable, pipe and asset inspection
- Shallow water mapping
- Environmental assessment

FEATURES

- Deployed from wide range of traditional survey vessels
- Easily deployed from Launch & Recovery system
- Operating common operating ranges (10-100m)
- Tow-speeds up to 8 knots
- Instrument array of up to 24 sensors installed on ROTV
- High Bandwidth data transmission 5.0 Gigabits/sec
- Compact & Efficient footprint on Deck for easy Handling

SURVEY EFFICIENCY & DATA INTEGRITY

- Reduced survey time combining all sensors in a single run
- Advanced survey solution with redundant instruments for complete data reliability
- Versatility for custom payloads
- Full 3D motion control on vehicle
- Side-to-side and undulation motion option
- User-friendly GUI control and monitoring software
- Increased stability and maneuverability in turns
- Optimal positioning of measurement instruments for data acquisition as close to the seabed as needed



TECHNICAL SPECIFICATION

DIMENSIONS

Length	1,830 mm
Height	1,750 mm
Width	1,510 mm
Weight in Air (without sonars)	450 Kg
Weight in water	Neutral

PERFORMANCE

Depth rating	300 m
Operational depth	200 m
Towing Speed	6-8 kts
Dive Climb Speed (m/min)	10
Vertical position Accuracy	0.1 m
Roll/Pitch measurement accuracy	0.5 deg
Roll/Pitch stability at fixed altitude	0.1 m

DATA ACQUISITION PERFORMANCE

Maximum Tow Cable Bandwidth	5 GB/Sec
Number of ETHERNET Channels	4 to 8
Data rates per ETHERNET Channel	250-300Mbps
Number of RS-232/RS485 Channels	8 to 16
Data rates per RS-232/RS-485 Channels	0.12Mbps
Cable	Armored Electro-Optic 2x Single Mode Fiber OD:9.98mm, 2x Fiber, 2 x #24 copper conductors

PAYLOAD

Dynamic Inclinometer	CTI TILT-55A
Current meter	
Precision Altimeter	
Hi-Def Camera	
CTD	Seabird SBE49
ISiIS Plankton Imager	Bellamare 55um x 30cm FOV
Fluorometer	Seabird Fluorometer
Nephelometer	Sequoia LISST 200X
Transmissometer	Seabird C-Star
Bioluminescence	Seabird UBAT FOS
Nitrate	Seabird Suna V2
Oxygen	Xylem Dissolved O2 sensor
DVL	Waterlink DVLA125
Magnetometer	Geometrix, Marine Magnetics
Sub Bottom Profiler	Edgetech, KONGSBERG
Side Scan Sonar	Edgetech 4205, Klein
Multibeam sonar	RESON, KONGSBERG
Cable & Pipeline Tracker	Optimal Ranging ORION
Sonar Imager	RESON, BLUEVIEW, TRITECH, DIDSON
Gradiometer, Trans Gradiometer Array (TGA)	

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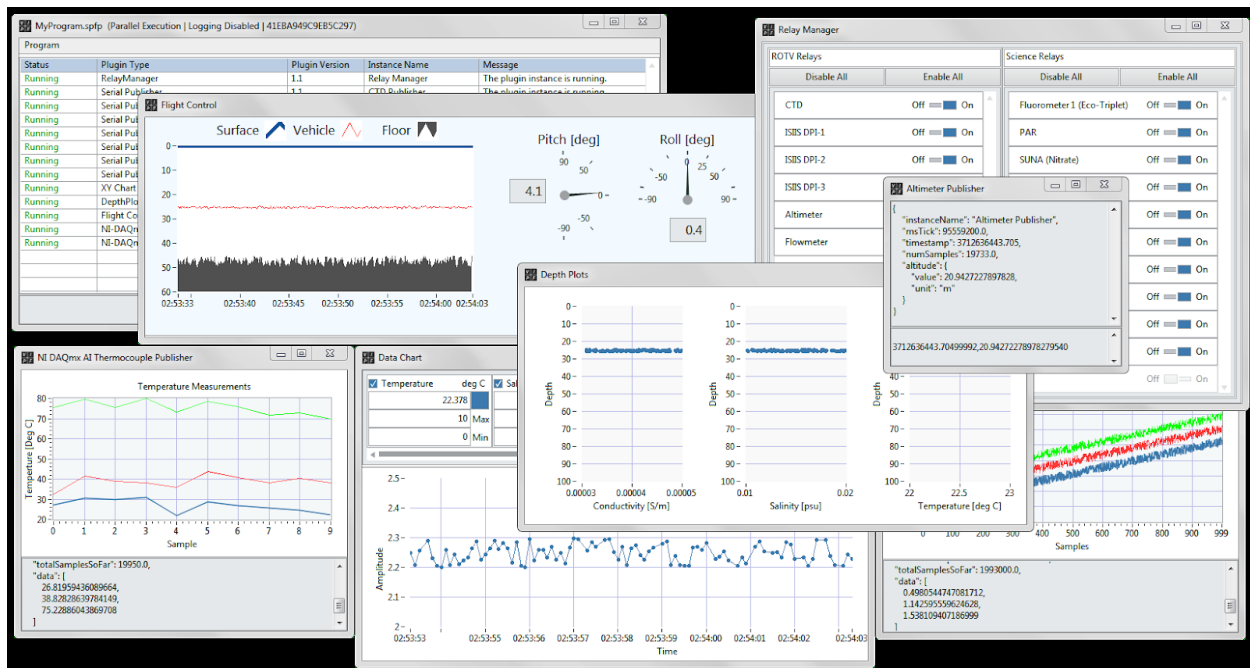
GENERAL DESCRIPTION

The ISIIS BoxKite XG is a multi-purpose, high payload, high Bandwidth (5Gbps) ROTV for oceanographic surveys. It is the latest advanced, 3rd generation and the most versatile in Bellamare's family of remotely operated towed vehicles (ROTVs). Designed to host the widest payload, the ISIIS BoxKite XG eliminates limitations from sensor and instrumentation of a typical ROTV, providing comprehensive multi-instrument data collection with every pass. The design offers the ability to operate in 3D motion with advanced precision steering, or operate in a robust, simple configuration with fixed wings. The Box Kite configuration offers extremely fine motion control and stability in all directions.

The ISIIS BoxKite XG is designed around a very solid box frame for safety and protection during operation. It is capable of operational speed of 5 to 8 knots. The high level of stability makes it an ideal vehicle for instruments and for payloads that are sensitive to undesirable surface and water movements. In shallow waters, typically less than 200m, the ISIIS BoxKite offers superior efficiency and performance, in terms of speed, cost and payload capacity, for subsea survey operations compared to ROV or AUV solutions.

SYSTEM SOFTWARE

All Bellamare towed vehicles include Sixclear VI Plugin Framework (VIPF) software for controlling and monitoring vehicle operation, scientific instrumentation, and other payload devices. Vehicles integrate several highly configurable, communicating plugins which provide flight control, graphing and plotting, sensor data acquisition, data logging, raw camera capture, and more. VIPF plugins are designed to be quickly and easily reconfigured to adapt to changing instrument payloads and display needs. Bellamare and partner Sixclear work closely together to ensure tight software and hardware integration while maintaining flexibility and reconfigurability.



BELLAMARE ISIIS BoxKite XG Sixclear VI (VIPF) Framework Control and Monitoring Software

ADVANCED SUBSEA 3D NAVIGATION

The Box type design of the ISIS ROTV naturally offers steering control in all three directions through the precision control of its vertical and horizontal diving fins. This enables the vehicles to be towed through the water column with precision, flexibility and execute advanced dynamic run lines, especially when currents create lateral offsets, affecting the ROTV position or when towing to deeper depths. The ISIS BoxKite XG is designed for a maximum operating depth of 200m and remains exceptionally efficient for shallow depth, from 10-30 meters. Altogether, ISIS BoxKite XG presents superior performance on subsea survey operations.

The simple and practical design makes the vehicle robust so that it can be deployed in rough weather and water conditions. This reliability reduces risk and downtime, ultimately saving time. The box structure offers complete protection to the instruments within, offers convenient holding and grabbing surfaces, facilitating handling which also reduces the risks posed to the ROTV in the water and ensuring the safety of the crew during deployment and recovery.

BUDGETARY PRICING

SYSTEM	DESCRIPTION	ROM COST
ROTV Vehicle	ISIS BoxKite XG Gen III	\$ 350,000
Telemetry and Controls	Data Acquisition Pod and Telemetry Topside control station Data Acquisition/ Sled Control Software	\$ 125,000
ROTV WINCH SYSTEM	Oceanographic Winch Rotary Electro-Optic Joint Armored Electro-Optic Cable	\$ 100,000
TRAINING & SETUP	On-Site Installation & Training Maintenance and Operation	\$25,000
SENSORS & INSTRUMENTS	LIST OF OPTIONS	
	Dynamic Inclinator	\$ 1,000
	Current meter	\$15,000
	Precision Altimeter	\$10,000
	Hi-Def Camera	\$20,000
	CTD	\$15,000
	ISIS Plankton Imager	\$27,500
	Fluorometer	\$15,000
	Nephelometer	\$50,000
	Nitrate	\$32,500
	Oxygen	\$8,000
	DVL	\$25,000
	Magnetometer	\$10,000
	Sub Bottom Profiler	\$50,000
	Side Scan Sonar	\$30,000
	Multibeam sonar	\$75,000
	Sonar Imager	\$45,000

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