

Product Specifications

Nova Ray® ROV Model 3000 Package

The Model 3000 (M3000) is a rugged portable, submersible Remotely Operated Vehicle (ROV) equipped with 360-degree forward scan sonar. It records data, images and provides real-time feedback to the operator. The specially designed Nova+ skids provide for extra payload. This model features as standard two configurations for dual applications.



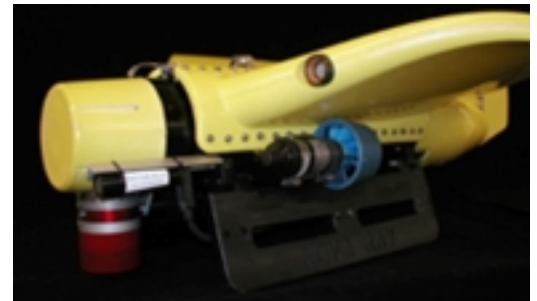
Standard Features

- ◆ Forward scan sonar
- ◆ 2 configurations for multiple tasks
- ◆ Removable nose extension with viewing dome replacement
- ◆ Nova+ skids for extra payload
- ◆ Proprietary Command and Control software with interval upgrades
- ◆ Fully digital onboard electronics
- ◆ Two, 1/4 hp thrusters
- ◆ Dual operation mode (tow it in up to 9 knot currents or use thruster power)
- ◆ External and Internal camera system
- ◆ Integrated surface control console: (3-axis joystick; laptop; LCD video monitor; water tight case with wheels and telescoping handle)
- ◆ Tools & Parts Standard Kit (TAPS)
- ◆ Transport/operation cases with wheels and telescoping handles
- ◆ 3-auto pilot modes for multi tasking
- ◆ Dual quartz lighting system
- ◆ 300-ft. umbilical
- ◆ Patented channel and rail system for user add-on technology

True Axis Flight with Patented Wing Design System

Like all Nova Ray® ROVs, M3000 delivers unequalled ocean and river maneuverability, stability and performance. With true-axis flight, M3000 helps projects stay on course for mission critical inspections and surveys. The portable, multi-use platform incorporates the Nova Ray® ROV patented arcuate wing.

The bow shaped wing and ROV design solve cable drag problems in strong currents and cross currents. The Nova Ray® ROV uses its umbilical to advantage. It can be towed-- operating much like a kite -- or fly under its own thruster power.



Multiple Uses Designed into One Compact ROV

Applications for the M3000 include detection and /or obstacle avoidance (obstructions and other hazardous devices) and area surveillance. The M3000 is ideally suited for baseline and repetitive imaging of specific locations and structures, or for environmental monitoring. This model offers an additional configuration. Removal of the nose extension system allows for use of the vehicle for basic survey and inspection projects. Where needed, an optional conversion kit is available for converting the Nova Ray® ROV to a digitally operated conventional

ROV. Articulating arms (or manipulators) are available as optional user add-on devices.

Fast Mobilization and Field Serviceability

With fast mobilization from inflatable boats to larger vessels, this ROV is adaptable to applications in oceans, ports, rivers and wilderness lakes. Quick field assembly and basic maintenance is possible by one person.



Category	Standard Feature	Nova Ray® ROV Model 3000 Specifications
Performance		
Depth	Depth Rating	305meters (1,000 feet).
Currents	Stability in Strong Currents	Arcuate wing design counters destabilizing effects of cable drag. Results in faster, more stable performance in currents with less cable.
Maneuverability	Dual Operation Mode	Can be towed or use thruster power in strong currents. See Speed for knots.
	Speed	Up to 9 knots in currents under tow. With thrusters: 4 to 6 knots (¼ or 1/3hp respectively)
	Cable to Depth Ratio	Under tow, Nova Ray® provides deeper operation with less cable than other Underwater Towed Vehicles (UTV). Nova Ray® can operate up to 70% deeper than conventional UTV systems using the same cable length. Under tow, operates at a ratio of 2.38:1. With thrusters, the Nova Ray® can reduce the ratio to 2:1. With less cable, the Nova Ray® system is lighter, smaller and easy to deploy anywhere in the world on a rapid response basis.
	Thrusters	DC brushless rare earth motors. Two (1 port; 1 starboard) magnetic drive: ¼ hp standard with 150 volts DC. Optional 1/3 hp. Propellers and Thruster Guards (HMW plastic): 75mm for 1/4 hp., and 90 mm for 1/3 hp.
	Control Surfaces	Rudder provides directional control; two elevons provide vertical positioning (depth control).
Umbilical	Length, Diameter, Type	Length: 300 ft (91.4 m). Diameter: 15mm. Type: 12-conductor, neutrally buoyant.
	Custom Umbilical	Length to fit user specifications; optional fiber optic available.
Temperature Rating	Operating Range	-2 to 42 degrees C.
Command and Control System		
	Integrated Control Console	3 axis joystick; mode selection buttons and slide throttle; auto pilot capability; LCD monitor; laptop with proprietary Windows™ based software; LCD video display. I/O: video out, monitor in; RS-232 and RS-485, hydrophone ready.
	Digital Onboard Electronics	Fully Digital: Precise control and easy integration of digital peripheral devices. Proprietary embedded software.
	Proprietary Software	Aeronautical style display showing pitch & roll and elevon, rudder and thruster direction and magnitude. Reports depth, heading, internal temperature. Heads-up video overlay enabled.
	Flight Control	Choice of manual or 3 auto pilot modes: Heading Hold, Wings Level and Depth Hold (optional altimeter provides an additional mode: Altitude Hold).
Instrumentation		
	Depth Sensor	Depth gauge with range of 0 to 340 meters.
	Compass	Solid state with pitch and roll correction and integrated thermometer.
Imaging		
	Forward Scan Sonar	360 degree scan; multi-frequency: 310 kHz, 675 kHz, 1 MHz. 20-36VDC at < 5 watts; interface RS-485 or RS-232.
Video, Camera, Lights		
Video Display	Flat Panel Monitor	254mm color LCD video display monitor. NTSC or PAL Composite. Out Port: RCA and S Video.
Internal Camera	Type and Resolution	Color. 480 TVL (Hi Res maximum for color), 1/3" CCD, NTSC or PAL.
	Sensitivity and Lens	1 lux @ F1.2 for color camera. Lens: 4mm, F1.2 or wide angle: 2.6mm, F1.6.
	Focus and Tilt	Adjustable with auto white balance and auto iris. Manual tilt range: 90 degrees.
External Camera	Type and Resolution	Color. 480 TVL with CS (Hi Res maximum for color), 1/3" CCD, NTSC or PAL.
	Sensitivity, Lens, Power, Current	1 lux. 2.9mm F1.4 standard, or 3.7mm F1.4. Power: 12Vdc only; Current: 160mA max.
	Focus and Scanning	Standard 100mm to infinity. Scanning: 525 line 60Hz NTSC or 625 line 50Hz PAL.
	Signal to noise ratio, view angle of view, composite video output	Signal to noise ratio: >48dB (AGC off). View angle: 92 diagonal in air; 65 in water for 2.9mm lens. 78 diagonal in air; 56 in water for 3.7mm lens. Video output: 1.0V pk-pk.
Lights	Front Lights	Dual 150 Watt mini quartz. Beam pattern 78 degrees (included angle to half power point).
ROV Characteristics		
Physical	Length, Width, Height, Weight	L: 1,114mm. W: 997mm. H: Body: 268mm; Rudder: 393mm. Weight: 32 kg.
Electrical	Connectors	Standard watertight bulkhead connectors and two accessory connectors.
	Line & Umbilical Voltage, Power	Line: 120 VAC 60hz. Umbilical: 109 VAC. Power Consumption: 900 -1100 Watts.
Housing	Construction	Single piece, anodized 6061 T6 aluminum hull with patented channel and rail system for wings, thrusters, skids & add-on devices (no welds nor hull penetration, and includes triple "O" rings to ensure watertight integrity of housing system. Includes nose extension and Nova+ skids.
ROV Construction	Material	Key ROV molded components: impact resistant, light weight polyurethane resin. Accessory fittings and mounts are stainless steel or aluminum for corrosion resistance and durability.
	View and Light Ports	View dome: annealed, impact-resistant 3/8" acrylic. Lights: ¼" quartz window and depth rated to 1,000 meters.
Other		
	Transport Cases	Water-tight control console case is carry-on commercial airline luggage. 3-cases for ROV and umbilical shipped as commercial luggage. All include telescoping handles and wheels.
	Shipping Weight	Control Console: 20 kg. Transit Cases: 81 kg. total.
Tools & Spares	Tool Kit	TAPS Kit (Tools and Parts Standard) provides for basic field assembly and servicing.
Warranty	Agreement	Details available from customer service.