INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai 400076.

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Detailed Technical Specifications for Unmanned/Remote controlled Underwater Bathymetry Mapping System

Sr. No	Components		Specifications	Remarks
1	**Unmanned Survey Vehicle (USV)- Remote controlled boat**		1 quantity	
	Physical	Dimension	< 1.2m[l]*0.6m[w]*0.4m[h]	Compact one-man operation
		Weight (without battery)	**≤ 10 kg**	
		Hull Material	Carbon	
		Payload capacity	≥5 kg	Options to fit additional sensors such as ADCP
		Propulsion type	Water-jet propulsion or modular culvert	Tangle free system for navigating through water plants
		Temperature Range	-5℃ to 40 ℃	
		IP Rate	IP67	
	Communication	**Remote Control**	**≥ 1 km**	Touch screen based controller to control the boat and transmit data with the boat at the same time.
		Data Telemetry Range	≥ 1 km	
	Performance	Survey speed	≥ 2 m/s	Suitable for surveys in lakes, reservoirs, rivers, coastal backwaters, and nearshore coastal surveys
		Max speed	≥ 5m/s	
		Endurance	**At least 4 hours**	
		Battery capacity	33v/40AH lithium battery	
	Control and Safety Systems	**Navigation**	**Auto pilot (Autonomous survey mode) Auto Pilot**	Switchover capability between Auto pilot mode and manual mode at any time.
		Safety Guarantee-Auto return	**Auto-return while low battery or signal loss**	
		Function	**Real-time switching operation mode, control ship speed, steering and other functions, display the basic information**	

2	**GNSS Positioning System**	01 quantity (Rover) and 01 quantity (base) with same specs for accurate positioning of bathymetry surveys	Compatible with USV and Echosounder Real time Kinematic Positioning system (RTK) capability
	Number of Channels	Minimum 200 channels	
	Signal tracking	GAGAN, GPS, GLONASS, SBAS, Galileo, QZSS, WAAS, MSAS, EGNOS	
	Accuracy	Static GNSS: ±2.5mm (H) & ±5mm (V) or better RTK: ± 8mm (H) & ± 15mm (V) or better	
3	**Echosounder**	1 quantity	Compatible with GNSS Positioning system and Remote-controlled survey boat
	Min and Max Measurable Range	50 cm to 200 m	Accuracy: ±1cm ± 0.1% of depth
	Transducer Frequency	200 KHZ	Ping modes Single (Ping rate between 20 and 50 Hz)
	Beam width	26°C/5°C	
	Backscatter measuring resolution	7.5mm	
	Altitude Range Resolution	1mm	
	Data Output Interface	USB/RS232/RS485	
	Built in sensor	Roll and pitch n 0.1deg resolution	
	Data formats	Echogram, NMEA, PSA, DESO25 etc.	
	Weight and dimension	Portable and < 1 kg	

Other Criteria: It is preferred that the OEM has service centers and/or distributors in India

Additional Terms and Conditions:

1. The responsibility of assembly and integration of different components of the USV System shall solely lie with the vendor and any cost of damage during assembly shall not be borne by the purchaser.
2. The vendor shall provide the purchaser with the quality clearance/ test certificates and results, manufacturer datasheet of the USV System and all its components and other documents such as, but not limited to, operation and maintenance manuals, drawings of the machine parts, study material etc. (all in English language), on the day of installation and commissioning, failing which the USV System and all its components shall not be considered to be completed for the purposes of taking over and subsequent payment.

3. The vendor shall carry out all the inspection/tests of the USV System and all its components at their own expenses in the presence of the purchaser or purchaser designated representative. After the assembly, inspection and prior to shipment, the vendor must ensure the conformity of the goods to the technical specifications and issue a manufacturer's test certificate to that effect, which shall be submitted along with the delivery documents.
4. If any inspected or tested parts of the USV System fail to conform to the specifications, the purchaser may reject part, or the USV System and the vendor shall either replace the rejected part or make necessary alterations to meet specification requirements at free of cost to the purchaser.
5. The purchaser reserves the right to inspect, test and, where necessary, reject the USV System and all its components (in case of malfunctioning) after its arrival at destination shall in no way be limited or waived by reason that the USV System and all its components having previously been inspected, tested, and passed by the purchaser or their designated representative prior to the shipment of the USV System and all its components.
6. In case of import of the USV System and its related parts, the responsibility of all matters related to insurance of the USV System, and all its parts shall lie solely with the vendor and the purchaser, in no case, shall be responsible for any delays in claiming the insurance. The purchaser, in no case, shall be responsible or for any damage to the USV System and its components during shipment or transit. Also, the purchaser shall not bear the expenses for such damages.
7. The vendor shall be the only single point of contact for the purchaser for all the issues/matters related to the USV System and its components from the date of award of tender till the end of life of the printer.
8. The vendor must provide on-site demonstration and training of the use of the USV System in all aspects, to the purchaser and team in a mutually convenient time frame. The demonstration and training shall be given within 14 days from the delivery of goods to the purchaser.
9. The vendor must extend technical support in resolving issues/defects related to USV System (inclusive of all components) and its operation during its lifetime (i.e., even beyond the warranty period) with appropriate cost associated with the service.
10. The vendor must provide at least 1-year warranty to the USV System and all its components from the date of installation and commissioning. Any upgrades to the firmware during the warranty period must be provided to the purchaser at free of cost.
11. The USV System will be accepted for delivery and subsequent payment, only after it successfully passes all the tests, including depth, position accuracy & measurement tests. On successful completion of acceptability test, receipt of deliverables, etc. and after the purchaser is satisfied with the working of the USV System and all its components, the acceptance certificate signed by the vendor and the representative of the purchaser will be issued. The date on which such certificate is signed shall be deemed to be the date of successful commissioning of the equipment.
    11.1 On the event of the ordered item failing to pass the acceptance test, a period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, failing which, the purchaser reserves the right to get the equipment replaced by the vendor at no extra cost to the purchaser.