INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

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Technical Specifications for Handheld Global Navigation Satellite System (GNSS) receiver with software

Sr No	Descriptions	Technical Specification Requirement	Technical Compliance (Yes / No)	Additional Information (if any)
1	**Category**	GNSS System required to have a receiver (antenna), a controller unit and other required accessories to carry out surveying operations. GNSS System should have simple installation and setup process.		
2	**Frequency**	Multi Frequency Capable GNSS System, which should support all global GNSS System.		
3	**Channels**	1200+ physical channels or digital channels to track the GNSS systems mentioned below (signal tracking, S.no 5)		
4	**Positioning Technology in challenging environments**	Instrument should provide improved positioning and accuracy in challenging environment through any advanced technology.		
5	**Signal Tracking (Minimum requirements)**	GPS: L1C/A, L2C, L5		
		GLONASS: L1C/A, L2C/A, L3		
		SBAS: L1C/A, L2C, L5		
		Galileo: E1, E5A, E5B,		
		Beidou: B1, B2A		
		QZSS: L1C/A, L2C, L5		
		NavIC (IRNSS): L5		
		Additional signals will be preferred		
6	**Band Facility**	Built-in L-band facility and satellite-based correction through the working lifespan of the instrument.		
7	**Modes of functioning**	It should be capable of working in Static, Real Time Kinematic Mode (RTK Mode), PPK and Navigation mode. Radio based RTK is preferred.		
8	**Accuracy**			
		With Real Time Satellite based corrections		

		Horizontal Accuracy: 10 cm or better		
		Vertical Accuracy: 20 cm or better		
		With Network RTK/ Survey of India CORS station		
		Horizontal Accuracy: 10 mm + 1 ppm or better		
		Vertical Accuracy: 20 mm + 1 ppm or better		
		With Single Base RTK:		
		Horizontal Accuracy: 10 mm +1 ppm or better		
		Vertical Accuracy: 20 mm +1 ppm or better		
		With Static Mode Post Processed:		
		Horizontal Accuracy: 10 mm +1 ppm or better		
		Vertical Accuracy: 20 mm +1 ppm or better		
9	**Positioning Rate**	It should be 10 Hz or better		
10	**Tilt correction support**	System should be capable of providing tilt correction for the GNSS antenna.		
11	**Data Protocols**	Should support NTRIP, RTCM 3.x, VRS Should Support NMEA (LLH) Position output or Equivalent / Better.		
12	**Operating System**	GNSS System should be capable of working in Android 12/ Windows 10 or above running field data applications.		
13	**Environmental Parameters**	GNSS System should be rugged enough to work in the field with IP 67 rating (IP 68 rating or above preferred). This should be able to survive maximum 2 m tipping falls.		
		Temperature:		
		Operating Temperature: -20 °C to 60 °C		
		Storage Temperature: -40 °C to 70 °C		
		Operating Altitude: It should be good enough to work in altitudes upto 5000 m above mean sea level or higher.		
14	**Weight**	The GNSS Antenna System should be lightweight and should be around 1 kg or less.		
15	**IP Rating**	65 or better		
16	**Battery**	Internal or External Battery if external Battery it should be replaceable in the field, and it should work minimum 5 hours or better (Minimum 2 Battery to be supplied). If Internal Battery, then it should work for minimum 8 hrs or more		
17	**Connectivity**	Wireless Bluetooth/ wifi Connectivity.		
18	**Data Integration**	Data syncing of Field to office and From Office to Field through Internet in Real time Details of such software to be provided.		

19	**Applications**	GNSS system should be capable of working in GIS and Survey applications like Utility, Land Survey, GIS work, etc.		
20	**Controller Specifications**	OS Android 12 or Windows 10 or better, Processor- Octa Core or Better, RAM - Minimum 4 GB or better, Internal memory 64 GB or better. Display 5” or above, sunlight readable. Physical keypad or touchscreen-based input supported, Controller should have functional rear and front camera used to take pictures of inaccessible areas for further coordinate estimations.		
21	**General conditions**	A. Field Data Collection Software in the controller should work with all functionalities throughout the working lifespan of the instrument. Periodic necessary updates will be preferred. B. The controller and the field software should be user friendly with graphical user interface for easy field operation. C. The controller should be able to store the GNSS data collected by the system. D. The data collected should be easily transferrable to a computer for further processing. The GNSS data should be in generic format that is independent of the office software used. i.e the GNSS data should be opened and processed in any available software in the market that works with generic GNSS data. E. Make, Model & origin of the offered product should be quoted clearly, failing which offer will be rejected. F. The bidder shall be fully responsible for the manufacturer’s warranty including all spares (Comprehensive) for a period of 60 month from the date of receipt & acceptance of material). Consumables Like Internal Battery, External Battery for receiver, Range Pole and Bipod should have 6-month Warranty for the date of supply. G. Inspection will be done at consignee place after receipt of materials at consignee place. H. All necessary accessories for data collection and data storing should be supplied. I. During instrument failure situation, supplier should be responsible for transport of instrument (To and fro from IIT Bombay) for repairs for a minimum of 5 years. After completion of repairs, instrument should be returned back within 10 days from the date of receipt of instrument. J. If the instrument is with supplier for repair purposes, supplier should arrange another similar instrument in place of original instrument till return of original instrument after completion of repairs K. The successful vendor should provide on-site training for the GNSS field unit. L. Official detailed hands-on training for the field instrument should be provided till end user satisfaction. As a part of training, the field		

		instrument detailed operating manual and video tutorials should be provided. M. In future, necessary training and technical support when required should be provided by the supplier, throughout the life of the field instrument.		

Sr No	Scope of Supply List of Deliverables (BOM) of Instruments with Accessories	Qty
1	GNSS Antenna	**18**
2	Controller with Charger and Cable	**18**
3	Field Data Collection Software with license through the working lifespan of the instrument	**18**
4	Pole 2- Meters for GNSS Rover	**18**
5	Bipod for Pole	**18**
6	Battery	
	If internal	**18**
	If external	**36**
7	Charger for Battery	**18**
8	Bracket for Controller	**18**
9	Soft/Hard Carrying Case	**18**