



**THIS IS NOT
AN ORDER**

REQUEST FOR BIDS/PROPOSALS COVERSHEET
THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Procurement and Contract Services
118 College Drive #5003, Hattiesburg, Mississippi 39406-0001

Date: October 31, 2025

Name: _____

Company: _____

Address: _____

City/State/Zip: _____

BID No. 26-14

THE UNIVERSITY OF SOUTHERN MISSISSIPPI is considering the purchase of the following item(s). We ask that you submit your bid and retain one copy for your files. Right is reserved to accept or reject any part of your bid. Your quotation will be given consideration if received in Bond Hall, Room 214 on or before:

2:00 p.m. CT

November 19, 2025

TERMS - Bidder should state terms of sale. Our terms are 2% ten days, net 45 days.

These terms will apply per Mississippi law.

AWARDING CONTRACT - Cash terms will not be used as a basis for awarding contracts; however, the University will accept cash discounts when earned.

Buyer: Amber Floyd

NOTE: If you cannot quote on the exact material shown, please indicate any exception giving brand name and complete specifications of any alternate. If additional space is required, use a separate sheet or letter of transmittal.

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL NET PRICE
		BID 26-14 GNSS-IMU Intertial Positioning System		
		RFx # 3160007717		
		PROPOSAL MUST BE RETURNED TO THE UNIVERSITY IN ACCORDANCE WITH THE SPECIFICATIONS. RFP NUMBER AND DATE OF BID OPENING MUST BE SHOWN ON THE OUTSIDE OF THE ENVELOPE IF USING THAT METHOD.		

We quote you as above - F.O.B. The University of Southern Mississippi.
Shipment can be made in _____ days from receipt of order. DATE _____
Return quotation to Procurement Services at above address.



THE UNIVERSITY OF
SOUTHERN
MISSISSIPPI®

**SYSTEM DESIGN SPECIFICATIONS FOR A GNSS-IMU INERTIAL POSITIONING
SYSTEM**

The University of Southern Mississippi

Prepared by Steve Stanic and Landry Bernard

Oct 23 /2025

SYSTEM DESIGN SPECIFICATIONS FOR A GNSS-IMU INERTIAL POSITIONING SYSTEM

I. Background

The University of Southern Mississippi's Roger F. Wicker Center for Ocean Enterprise, located at the Port of Gulfport, MS has been researching and testing advanced uncrewed systems using novel sonar sensor designs, and on-board processing to create advanced maps of acoustic sensor data over a broad range of environmental and platform noise conditions.

The University of Southern Mississippi (USM) has received funding to purchase a high-resolution GNSS-IMU aided inertial positioning system optimized for marine applications. This system will be integrated into USM's SeaTrac Multibeam sonar system which will be used to map the location of specific targets inside USM's CUBEnet test range environment.

II. Purpose

The University of Southern Mississippi (USM) has developed the environmental measurement framework, data processing, visualization products, and ocean measurement systems required for testing and performance evaluations of these high-resolution SAS systems.

This document contains the minimum requirements for a high-resolution GNSS- aided inertial positioning system optimized for marine applications. This GNSS-IMU system will be integrated with USM's Multibeam system for high resolution target detection, classification, and localization (DCL) of low/medium/high target strength targets over a broad range of environmental and platform noise conditions. This GNSS-IMU system will map the location of proud and partially buried targets deployed in USM's CUBEnet test range.

III. General Requirements

1. The system shall provide six-degree positions and orientation data.
2. The system shall provide accurate altitude, heading, heave, pitch and roll, position, and velocity data.
3. The system shall use a high-resolution inertial unit (IMU), use a global navigation satellite system (GNSS), and a small form factor PCS.
4. The system shall have ethernet input and output ports.
5. Time, system status, position, altitude, velocity, track, speed, raw IMU and GNSS data shall be available at this port.
6. The system shall have a display port, UDP protocol.
7. The system shall have a TCP/IP control port..
8. The system shall have ports that provide data logging to an external device.
9. The system shall have user assignable serial RS 232 input/output ports.
10. The system shall have a NMEA ASCII output that provides system output parameters at a 50 Hz maximum rate and shall be user selectable on each port.
11. The system also shall have a high-speed attitude output (attitude, heading, speed).
12. Output and rates shall be configurable for each port.

13. The system shall have auxiliary GNSS 1 Hz NMEA Standard ASCII inputs.
14. GNSS correction inputs shall accept RTCM V2., V3., CMR, CMR+, and CMR+.
15. These input rates shall be at least 1Hz.
16. The system shall accept digital I/O at no less than 1 PPS.
17. The delivery arrangements and transportation costs shall be the vendor's responsibility.
18. The GNSS-IMU inertial positioning systems shall be delivered to USM's Marine Research Center, 1030 30th Ave Gulfport, MS 39501.

IV. The following table outlines the minimum physical and system performance specifications that the GNSS-IMU shall meet to perform the tasks necessary to satisfy USM's project objectives.

Table 1 General GNSS-IMU Physical Specifications	
Small form factor PCS	Description/Value
Weight	Shall be less than 3 kg
Size	Length < 200 mm, Weight < 200 mm, Height < 70mm
Operating temperature range	-20°C to 50°C
Power	10 to 35 V
Inertial measurement unit	
Weight	< 3 kg
Operating temperature Range	-30°C to 50°C
IP Rating	IP65
Global Navigation Satellite Antenna	
Weight	< 1 kg
Operating temperature Range	-50°C to 60°C

V. The following table outlines the minimum position specifications that the total system shall meet.

Table 2 General GNSS-IMU Performance Specifications	
System position resolutions	Horizontal: less than 4 cm, Vertical: less than 7 cm
Pitch and Roll resolutions	Less than 0.03°
Heading	Less than 0.02° with 4 m baseline, less than 0.03° with 2 m baseline
True Heave	5 cm or 5% over 20 second periods, 2 cm or 3% for 35 sec periods

The vendor shall also provide both pre-and post-processing algorithms to enhance the position, altitude, velocity, track, speed, heave, pitch and roll resolutions specifications listed in table 2.

VI. Options

The Vendor shall also provide the costs of the following options

Table 3 System Option	
Rack mounted PCS	
Weight	< 4kg
Operating temperature range	-20°C to 50°C

VI. Software

The vendor shall provide all ICD documentation for the GNSS-IMU system.

VII. Training

The vendor shall provide training on the operation, software, maintenance and troubleshooting integration of the GNSS-IMU. This training shall take place at the USM facility located in Gulfport MS.

VIII. Proof of Performance

The vendor shall provide a proven record of the GNSS-IMU system. The vendor needs to provide references where these systems and their operating system in a substantially similar configuration as specified above have operated successfully within the last 3 years. The above requested information will assist USM in determining the bidder's capability of meeting these requirements.

IX. Warranty Services

At a minimum, the Contractor shall provide software/hardware warranty support for one year from acceptance. Longer warranty periods are preferred. The Vendor shall agree to repair, adjust, and/or replace (as determined by the University to be in its best interest) any defective materials at the Vendor and/or manufacturers' sole cost. The University will incur no costs for service or replacement of materials during the warranty period. The Vendor will be the sole point of contact for warranty issues.

XI. Documentation

The Contractor shall provide Operations and Maintenance manuals to USM. Documentation provided shall include, but not be limited to the following:

- A. Theory of operation
- B. Operating procedures
- C. Interfacing instructions with connector pin outs
- D. Troubleshooting and maintenance procedures
- E. IPB (Isometric Parts Breakout) drawings showing how all parts, especially mechanical parts, relate to one another.
- F. Documentation of the various software packages.
- G. All sensor documentation and manuals.