

## Benefits

Accurate and precise position, heading, heave, pitch and roll in a single compact unit

Pre-calibrated (Rapid Deployment with no Field Calibration Required)

All systems are GPS, GLONASS, and BeiDou capable for position and heading seeding.

Ruggedized IP67 Rated Housing

Built-in NTRIP Client

Built in iHeave (no additional software or hardware required)

Improved Heading Lock Stabilization

Optimal performance and accuracy under conditions of poor GNSS access

Applicable for surveying to International Hydrographic Organization (IHO) S-44 standard

F280 series directly supported in leading Hydrographic Survey applications

Easy to use Web Interface

Highly Competitive Price

Round -the-Clock Technical Support



## Pre-Calibrated Variant F290<sup>®</sup> for accurate and reliable MOTION and Positioning data in a compact Ruggedized IP67 Rated Housing.

**The Pre-calibrated Variant of the F280<sup>®</sup> GNSS-Aided Inertial Navigation System (Attitude and Positioning Systems) is delivered calibrated and ready for use, thus facilitating rapid and repeatable field deployment and removes the need for field calibration (in the form of figure of 8's). The F280<sup>®</sup> Pre-calibrated variant is one of the models within the F280 Series<sup>®</sup> which is our new generation of high accuracy measurement instruments for use in the marine hydrographic and laser survey market. This new generation of GNSS-Aided INS systems embeds high accuracy inertial components and smart fusion algorithms.**

Includes built-in NTRIP Client that allows receiving GNSS RTK quality GNSS Corrections over the internet without need of any PC. F280 Series<sup>®</sup> must be connected to Ethernet network with Internet access and a separate NTRIP subscription.

Designed to meet the exacting and demanding requirements of the hydrographic survey market, the F280<sup>®</sup> instruments are easy to install and use. These instruments produce very accurate positioning, heading and MOTION data in the most dynamic offshore conditions. The Pre-calibrated variant facilitates rapid and repeatable deployment since this variant removes the requirement for field calibration.

The light and rugged F280<sup>®</sup>, packaged in an IP67 rated housing, is a reliable, repeatable, and cost-effective solution suitable for use on vessels of all sizes. The F280<sup>®</sup> is one model within the F280 Series<sup>®</sup> of GNSS-Aided instrument. This model is single frequency, dual antenna multi-GNSS receiver for improved constellation coverage and heading lock stabilization. The unit supports SBAS and DGPS corrections services.

An easy-to-use and intuitive web interface provides configuration, control and processing functionality including built-in iHeave (intelligent heave). In addition to real-time heave measurement and output, the F280<sup>®</sup> now directly computes and outputs our long-standing and proven iHeave (intelligent Heave) solution without the need for top-side processing or software

## Features

- One-Box solution Survey Grade GNSS, attitude and heave sensor
- Multi-frequency multi-GNSS (GPS, GLONASS, BeiDou, GALILEO, QZSS) receiver and RTK corrections activation to allow a maximum positional accuracy of 1 cm.
- With addition of integrated Atlas corrections receiver and Atlas H10 Global Correction Service License (L-Band). (Yearly Subscription for Atlas Service required.)
- Connectivity to multiple sensors simultaneously over Ethernet and Serial
- Built-in NTRIP Client capable of receiving GNSS Corrections over Internet.
- Multiple Lever Arms to support precise INS Positioning for Multiple Platforms locations or Sensors
- Explicit vessel Centre of Gravity (COG) support for improved heave accuracy
- Rapid Heading Initialization (Under 30 seconds typically)
- Web-Based Set Up
- Real Time Monitoring of MOTION Events
- Option for Multiple Configuration Profiles and Instantaneous Recall of Profiles
- Enhanced performance under conditions of poor GNSS access
- Industry standard formats and interfaces
- iHeave (Intelligent Heave) Processing Capability included as standard
- Compatible with HYPACK, QINSy, CARIS and other navigation packages
- Pre-calibrated and repeatable (No field calibration required)
- Fully integrates with Motion UI for precise IMU to Antenna alignment
- Extendable to 2-meter Antenna Separation for higher heading accuracy solution
- ITAR free

## Applications

- Hydrographic Survey
- Bridge, dam, harbour inspection
- Dredging
- Offshore renewable energy
- Environmental survey
- Shipping channel survey
- Marine laser scan survey

### F290 Pre-Calibrated Variant

The Specification in this Data Sheet applies to the F290 Pre-calibrated variant, which is one of the models within our F280 Series®. F290 Pre-calibrated variant is a Multi Frequency multi GNSS system with RTK, DGPS and SBAS GNSS corrections capabilities (1cm positional accuracy). Higher accuracy models also available.

iHeave is a tailored solution specifically for long period ocean swell compensation and is fully integrated with the F290 Precision Attitude and Positioning Systems. In many parts of the world, hydrographic survey is severely affected by low frequency ocean swells often up to 70 seconds long, resulting in distortions in bathymetric measurements. Conventional techniques for real-time heave measurement can only offer limited accuracy and are insensitive to ocean swells exceeding 10 to 20 seconds. The inbuilt iHeave algorithm analyzes the raw motion data and allows a more accurate determination of the real heave motion experienced by a vessel and enables the output of precise heave values for all ocean swells

### Pre-Calibrated Housing Assembly Configuration

Dimensions (L x d x h)	Option 1
	2-meter antenna separation assembly 2152mm x 287mm x 231mm (84.7in x 11.3in x 9.1in)
Weight (excluding F280 & antenna)	Option 2
	1-meter antenna separation assembly 1232mm x 287mm x 231mm (48.5in x 11.3in x 9.1in)
Weight (including transit case)	8.5 kg (18.7lbs)
Humidity	19.5 kg (42.9lbs)
	Waterproof

**F290** The F290 is Multi Frequency multi GNSS system with Atlas H10, RTK, DGPS and SBAS GNSS corrections capabilities (1cm positional accuracy). There are other models within F280 Series® of GNSS-Aided INS Systems (Yearly subscription required).

All systems are GPS, GLONASS, and BeiDou capable for position and heading seeding.

Models within F280 Series® are field-upgradable. Pre-calibrated housing upgrades can be applied to any model.

### Dynamic Positioning

Positional Accuracy (RMS)	0.30m with DGPS correction (all models) 0.30m with SBAS correction (all models) 1.20m no correction (all models)
Roll and Pitch (1σ)	0.02°
True Heading (1σ)	0.04° (2m baseline) 0.025° (4m baseline)
Heave (1σ)	5cm or 5% (on-line) 3.5cm or 3.5% (iHeave)
Velocity (1σ)	0.014 m/s

### Physical (F280 Series®)

Dimensions	127mm x 155mm x 113mm (5in x 6.1in x 4.4in)
Weight	2.2kg (4.9 lbs)
Power	9-36Vdc, 15 Watts (110-240Vac adapter supplied)
Power and Data Cable	5m standard, or 20m, or 50m optional (16.40ft standard, or 65.62ft or 164.04ft optional)
Antennas	Single-Frequency, Multi-GNSS, SBAS capable
Antenna Cables	1.3m standard
Operating Temperature	-10° to 60° C 14° to 140° F
Waterproof	IP67 Rated (Maximum depth of 1 meter up to 30 minutes. When Power and Antenna connectors are mated.)
Vibration	0.1g <sup>2</sup> /Hz, 5-500 Hz

### Interfaces

Ethernet 100Mbit	Full control and configuration, high speed data output (COMPAC), NTRIP corrections User-configurable for position, heading and attitude strings. Choose from: TSS1, TSSHHRP, EM1000, EM3000, COMPAC, GGA, GSA, GST, GSV, GKG, HDT, PASHR, PRDID, PTCF, RMC, ROT, VTG, UTC, ZDA, PPS and SPD.
Serial Port 1	User-configurable for position, heading and attitude strings. Choose from: TSS1, TSSHHRP, EM1000, EM3000, COMPAC, GGA, GSA, GST, GSV, GKG, HDT, PASHR, PRDID, PTCF, RMC, ROT, VTG, UTC, ZDA, PPS and SPD.
Serial Port 2 & 3	As Serial Port 1
GNSS Correction Port	Correction input (DGPS, RTK) Formats: RTCM 2.1/2.2/2.3/3.0/3.1; CMR, CMR+
Other	1 PPS on BNC

### PC System Requirements

Web Interface Compatible with all major browsers.

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