# F280® Pre-Calibrated Assembly

*Precision Attitude & Positioning*

## Pre-Calibrated Variant F280® for Accurate and Reliable Motion and Positioning Data in a Compact Ruggedized IP67 Rated Housing

The F280® Pre-Calibrated Assembly is a GNSS-aided inertial attitude and positioning solution designed to support rapid deployment and repeatable installation for hydrographic, multibeam, and marine survey operations.

Based on the proven F280® platform, the system integrates high-performance GNSS technology, precision accelerometers, and gyroscopes with advanced navigation algorithms to deliver accurate positioning, heading, and motion data in demanding offshore environments. The system is supplied fully calibrated and ready for operation, eliminating the need for field calibration and significantly reducing vessel mobilisation time.

To further simplify installation, the pre-calibrated assembly incorporates a fixed baseline configuration and is supplied with extension arms, enabling either a 1m or 2m antenna baseline. This arrangement ensures consistent sensor geometry between deployments, improving repeatability and reducing setup complexity. The F280® is managed through an intuitive web-based interface, providing configuration, control, monitoring, and data processing functions.

### Some of the benefits to the *F280® Pre-Calibrated Assembly Unit* are:

**Factory-Calibrated and Ready for Immediate Deployment**
Pre-Calibrated Housing is designed for customers who require a simpler, faster, more flexible solution for accurate marine positioning

**Improved Heading Lock Stabilization**
Improved heading lock stability for consistent and reliable orientation performance in dynamic marine environments.

**Eliminates the need for Field Calibration**
Factory calibration removes the need for time-consuming calibration procedures on site, reducing setup effort and enabling faster deployment

**Supports Repeatable and Consistent System Installations**
Ensures reliable performance across multiple installations by maintaining consistent alignment and configuration

**Reduces Vessel Mobilisation and Installation Time**
Streamlined Installation process minimizes setup time and operational delays

**Configurable 1m or 2m GNSS Antenna Baseline**
Extension Arms available to provide option of 1 m or 2 m bandwidth for higher heading accuracy

**Web-Based Configuration and Control Interface**
An intuitive browser-based interface provides easy access to system setup, monitoring, and control functions

**Accurate Positioning, Heading and Motion Outputs**
All systems are GPS, GLONASS, BeiDou, GALILEO and QZSS capable for position and heading seeding for Hydrographic and Offshore Survey Applications



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The F280® Pre-Cal Unit combines advanced GNSS and inertial technologies within a single compact unit, reducing installation complexity while providing a complete source of navigation and motion-reference data. High-rate outputs of position, heading, pitch, roll, and heave support a wide range of hydrographic, geophysical, and marine construction applications where reliable motion compensation is essential.

Beyond its precise positioning, heading and motion sensing capabilities, the F280® incorporates our proven iHeave (intelligent heave) technology, delivering advanced heave compensation directly within the system without the need for top-side processing or software. 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.

Engineered to adapt to diverse vessel configurations, the system supports simultaneous connections to multiple sensors through Ethernet and serial interfaces. Flexible lever-arm management allows accurate referencing of equipment installed at different locations onboard, while dedicated Centre of Gravity (COG) modelling further refines motion calculations and improves overall measurement quality.

Operational efficiency is enhanced through rapid heading alignment, enabling the system to become survey-ready in a matter of minutes. The browser-based management environment simplifies deployment and fleet-wide standardization by allowing users to create, save, and instantly recall vessel-specific configurations, reducing setup time between projects. The close integration of inertial and satellite-derived measurements provides resilient performance in challenging operating conditions, maintaining reliable outputs during periods of degraded GNSS availability. This architecture helps minimize downtime and delivers consistent data quality throughout a survey mission.

Designed for straightforward integration into existing workflows, the F280® supports industry-standard data formats and interfaces and is compatible with leading hydrographic packages, including HYPACK, Qinsy, and CARIS. This enables survey teams to incorporate the system quickly without requiring significant changes to established acquisition or processing procedures.

**Example Applications where the F280® Pre-Calibrated Assembly plays a core component include:**

- Hydrographic Survey
- Bridge & Dam Inspections
- Dredging
- Offshore Renewable Energy
- Port & Harbor Security
- Environmental Survey
- Shipping Channel Survey
- Marine Laser Scan Survey

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| Positional Accuracy | 0.30 m with DGPS Correction<br>0.30 m with SBAS Correction<br>1.20 m No Correction |
| Roll and Pitch (1σ) | 0.02° |
| True Heading (1σ) | 0.04° (2 m baseline)<br>0.025° (4 m baseline) |
| Heave (1σ) | 5 cm or 5% (on-line)<br>3.5 cm or 3.5% (iHeave) |
| Velocity (1σ) | 0.014 m/s |

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| F280® Unit | |
| Dimensions | 127 mm x 155 mm x 113 mm<br>(5" x 6.1" x 4.4") |
| Weight | 2.2 kg<br>(4.9 lbs) |
| Power | 9 - 36 VDC, 15 W<br>(110 - 240 VAC adapter supplied) |
| Power and Data Cable | 5m standard (or 20m, or 50m optional)<br>(16.40 ft standard (or 65.62 ft, or 164.04 ft optional)) |
| Antennas | Multi-Frequency, Multi-GNSS, SBAS and Atlas corrections capable |
| Antenna Cables | 15 m (49.2 ft) standard<br>30 m (98.4 ft) optional |
| Operating Temperature | -10° to 60° C<br>(14° to 140° F) |
| Waterproof | IP67 Rated<br>Maximum depth of 1m up to 30 minutes<br>(When power and antenna connectors are mated) |
| Vibration | $0.1g^2$/Hz, 5-500 Hz |

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| Pre - Calibrated Housing Assembly | | |
| Dimensions (L x D x H) | 1 Meter Antenna Seperation Assembly<br>1232 mm x 287 mm x 231 mm<br>(48.5" x 11.3" x 9.1") | 2 Meter Antenna Seperation Assembly<br>2152 mm x 287 mm x 231 mm<br>(84" x 11.3" x 9.1") |
| Weight (excluding F280® & antenna) | 8.5 kg (18.7 lbs) | |
| Humidity | Waterproof | |

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| Interfaces | |
| Ethernet 100 Mbit | Full control and configuration, high speed data output (COMPAC), NTRIP corrections<br>User-configurable for position, heading and attitude strings. Choose from: TSS1, TSSHHRP, EM1000, EM3000, COMPAC, GGA, GSA, GST, GSV, GGK, 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, GGK, 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 |

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