ADVANCED NAVIGATION

# Poseidon Reference Manual

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# 1 Revision History

| Version | Date | Changes |
|---|---|---|
| 1.0 | 24/09/2014 | Initial Release |
| 2.0 | 17/12/2016 | Poseidon V2 Released<br>Mechanical Drawings Updated<br>Bulkhead connector cutout dimensions added<br>Antenna performance updated<br>Updated part number information |

# 2 Introduction

Poseidon is a subsea GNSS antenna that is designed for use on underwater vehicles that require the ability to obtain a GNSS fix when surfaced. The antenna is also suitable for marine vessels that are exposed to harsh conditions that are too extreme for a normal GPS antenna. The antenna is capable of tracking GPS L1/L2/L5, GLONASS G1/G2/G3, BeiDou B1/B2, Galileo E1/E5 plus L-band. The antenna is lightweight, compact, corrosion resistant and able to withstand depths of up to 3000 metres.

If you have any questions please contact support@advancednavigation.com.au.

# 3 Part Numbers and Ordering Options

## 3.1 Standalone Unit

| Part Number | Description | Notes |
|---|---|---|
| SUBSEA-ANT-2 | Poseidon Subsea GNSS Antenna (V2) | Includes one Poseidon V2 antenna (no mating connector provided) |

*Table 1: Standalone unit part numbers*

## 3.2 Accessories

| Part Number | Description | Notes |
|---|---|---|
| SUBSEA-ANT-BC | Poseidon Subsea GNSS Antenna Bulkhead Connector (includes sealing cap) | Poseidon Bulkhead Connector<br>Bulkhead Connector Sealing Cap |

*Table 2: Accerssories part numbers*

# 4 Specifications

## 4.1 Mechanical Drawings

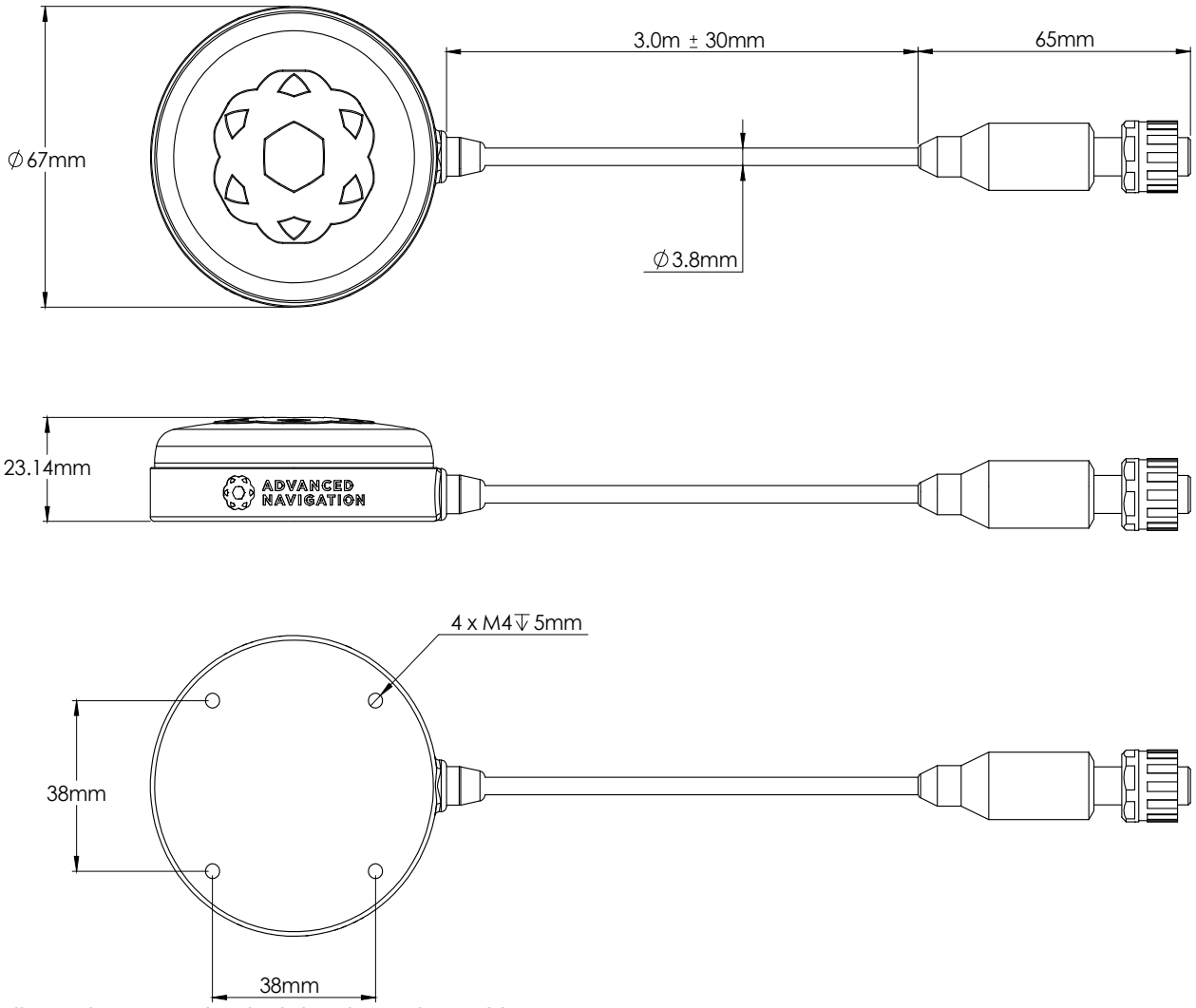


*Illustration 1: Mechanical drawings of Poseidon*

## 4.2 GNSS Antenna Performance

| Parameter | Value | |
|---|---|---|
| Supported Navigation Systems | GPS L1/L2/L5<br>GLONASS G1/G2/G3<br>GALILEO E1/E5<br>BeiDou B1/B2<br>L-Band Corrections | |
| Supported SBAS Systems | WAAS<br>EGNOS<br>MSAS<br>GAGAN<br>QZSS | |
| Antenna Element Gain | 4 dBiC | |
| Polarisation | Right Hand Circular Polarised | |
| LNA Gain | 28 dB | |
| Out-of-Band Rejection | < 1050 MHz<br>< 1125 MHz<br>> 1350 MHz<br>< 1450 MHz<br>> 1690 MHz<br>> 1730 MHz | > 45 dB<br>> 30 dB<br>> 45 dB<br>> 30 dB<br>> 30 dB<br>> 40 dB |
| Noise | < 2 dB typical | |
| Operating Voltage Range | 2.5 to 16 V DC | |
| Current Consumption | 20 mA typical, 25 mA maximum | |
| ESD Protection | 15 KV air discharge | |

*Table 3: GNSS antenna specifications*

## 4.3 Hardware

| Parameter | Value |
|---|---|
| Dimensions | 67 mm diameter x 23 mm |
| Cable Length | 3 m (custom lengths available) |
| Operating Temperature | -40 °C to 85 °C |
| Weight | 320 grams |
| Base Material | 316 Stainless Steel |
| RoHS Compliant | Yes |
| Shock | Vertical 50 G, other axis 30 G |
| Maximum Pressure Rating | 300 bar (3000 metres) |

*Table 4: Mechanical and environmental specifications*

## 4.4 Coaxial Cable

| Parameter | Value |
|---|---|
| Material | Polyether Polyurethane 4350 |
| Colour | High Visibility Orange |
| Operating Temperature | -40 °C to 85 °C |
| Impedance | 50 Ohms |
| Minimum Bend Radius | 15 mm |

*Table 5: Coaxial cable specifications*

## 4.5 Coaxial Connector

Poseidon's coaxial connector is designed to be compact with a diameter of only 15 mm. It has a maximum mated pressure rating of 600 bar allowing it to be used at depths of up to 3000 metres. The connector is made from 316 stainless steel and is over-moulded with polyurethane.

The connector is coupled to its mating connector with a thread mating nut and provides a water proof seal in the mated position only. Illustration 2 shows the dimensions of the coaxial connector.

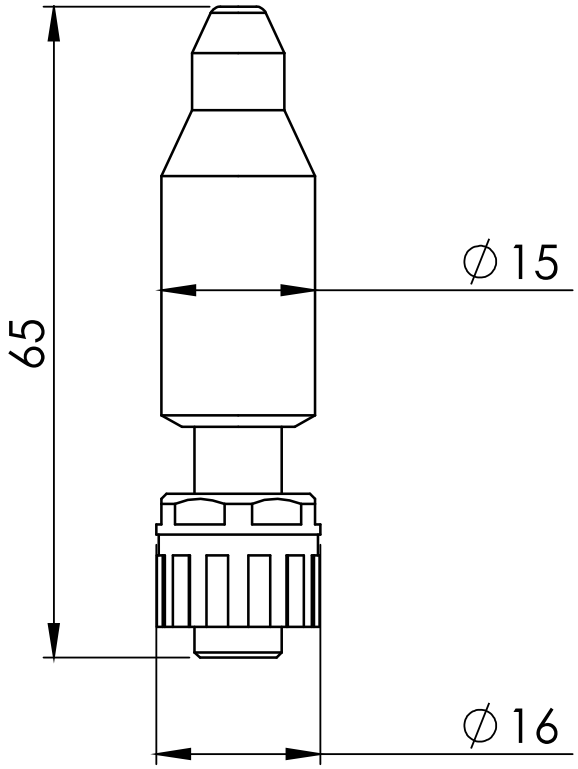


*Illustration 2: Subsea coaxial plug dimensions*

# 5 Installation

## 5.1 Positioning

When installing Poseidon into a vehicle, correct positioning is essential to achieve good performance. There are a number of goals in selecting a mounting site in your application, these are:

1. Poseidon should be mounted in a position that allows it to have a clear and unobstructed view of the sky.
2. Poseidon should be mounted in a position that is above the water line when the vehicle is surfaced.
3. The coaxial cable should be routed away from high voltage and high current wiring as well as rotating and reciprocating machinery.
4. The coaxial cable should not be pinched or squashed, and care should be taken if cable ties or other fastening methods are used to secure the cable.
5. The coaxial cable should not be bent beyond its minimum bend radius.

## 5.2 Mounting

Four M4 5 mm deep threaded mounting holes are available on the base of the unit. It is recommended that all four holes are used for secure mounting of the antenna. Screws made from 316 stainless steel should be used to avoid any problems with corrosion.

If mounted to dissimilar metals where galvanic corrosion may occur it is recommended that a rubber or plastic isolation pad is used between the antenna and other metal and either nylon screws or alternatively stainless steel screws with isolation washers are used.

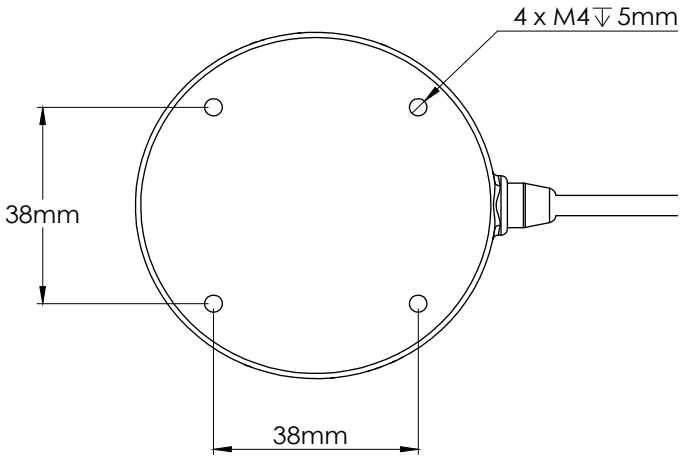


*Illustration 3: Threaded mounting hole locations on poseidon*

## 5.3 Connector Maintenance

Care should be taken not to over tighten the Poseidon connector. Tools should not be used when tightening the connector, it should only be tightened by hand.

The coaxial connectors are only pressure rated when they are mated. When the connectors are unmated, be careful not to allow dirt, water or any other foreign matter to get into the connector. If the connectors are going to be unmated for any extended period of time, please use the sealing cap provided.

If the connector becomes dirty or dusty it should be cleaned using cotton swabs with alcohol and dried with compressed air. Do not use scraping tools to clean the connector as these are likely to damage sealing surfaces. Always re-apply silicon grease to o-rings after cleaning to ensure smooth contact during mating.

## 5.4 Bulkhead Connector

The bulkhead coaxial connector for mating with the Poseidon antenna is shown below in Illustration 4. This connector is purchased separately by contacting Advanced Navigation sales. Advanced Navigation's Sublocus range of subsea navigation systems are equipped with the mating coaxial connector for Poseidon. Illustration 4 shows the dimensions of this connector.

The connector assembly is supplied with a Male SMA connector on the oposite end. By request this connector can be changed to other types. Please contact Advanced Navigation sales to request other options.

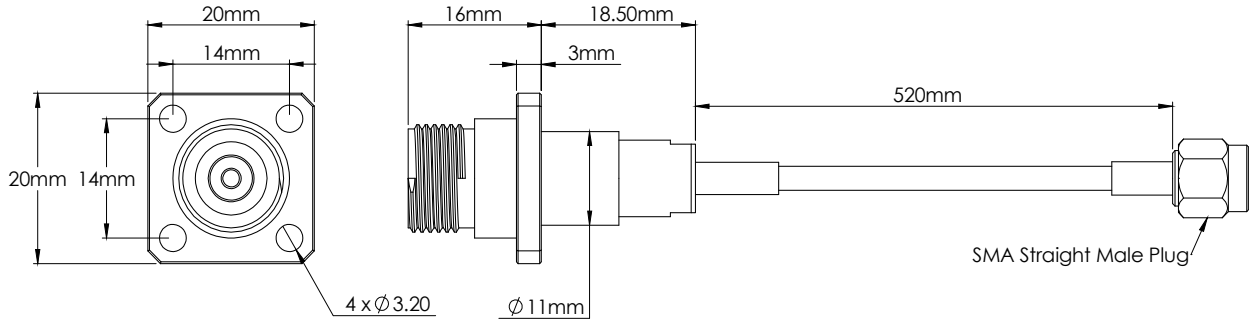


*Illustration 4: Dimensions of the bulkhead mount mating connector for poseidon*

Illustration 5 shows the panel cutout dimensions for the bulkead connector. The connector has an o-ring seal to the outer surface so this should be finished with a surface roughness of 0.8 µm (32 µin) or better.

## 5.5 Bulkhead

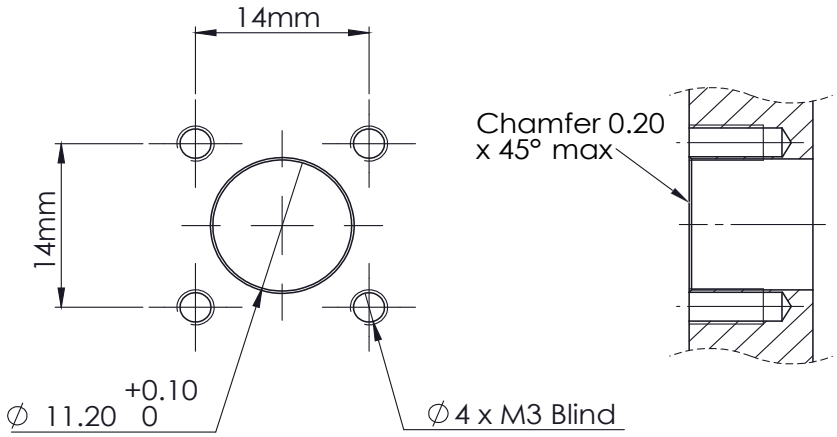


*Illustration 5: Panel cutout dimensions for the bulkhead connector*

### Connector Sealing Cap

A sealing cap is supplied with the Bulkhead Connector. The sealing cap provides water ingress protection up to 3000m when the antenna is not connected to the Bulkhead Connector.

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