L-3 Oceania has developed a long range subsea communications system with unprecedented communication reliability in a compact, power-efficient package. The GPM 300 Acoustic Modem can be used for sending and receiving data and/or voice through water for communications, monitoring and remote command & control under conditions where other modems fail. The leading performance of the GPM 300 is well proven with the modem successfully providing communications from the deepest point of the ocean; the Mariana Trench at 10,898 m (35,755 ft) for the Deepsea Challenge expedition in 2012.

Key Features

- Voice communications up to 25 km and reliable MASQ digital communications up to 45 km*
- Uses third generation MASQ multi channel Direct Sequence Spread Spectrum (DSSS) technology proven at full ocean depth and in harsh, multi path, reverberating and noisy hydro acoustic environments.
- Dynamic rate up to 1000 baud depending on required range and power to maximise battery life. As low as 10 baud for failsafe applications.
- Supports communication between platforms moving at speed
- Low Probability of Intercept for covert communications
- Power efficient, compact and lightweight
- Microsoft Windows® command and control interface or transparent data mode
- Compatible with L-3 ELAC UT 3000 underwater telephone and voice communication compliant with NATO STANAG 1074 UQC
- Advanced forward error correction with error rates less than 1x10^-4. MASQ multi-channel DSSS robust against multi-path inter symbol interference.
- Continuous Doppler correction
- Continuous channel equalisation compensates for channel fading and multipath

* Assumes best case sea conditions, no environmental noise and no effects of ray bending. Actual range obtained depends on deployment characteristics, environmental noise and sea conditions.

Typical Applications

- Sensor data transmission including pressure, temperature, salinity and wave height
- Wireless control of underwater equipment
- AUV/UUV status and control
- Text message exchange and voice communications with manned submersibles
- Communication with marine mammal and environmental monitoring devices
- ISR applications requiring transmission efficiency and Low-Probability-of-Intercept

GPM 300 with 1,500 m (4,900 ft) rated pressure housing

5,000 m (16,400 ft) rated pressure housing

Full ocean depth rated titanium pressure housing

500 Wh Alkaline or 200 Wh rechargeable battery pack

Command and Control Graphical User Interface
**Options**

- Data Logging to a 32 GB SD Card
- One way Time-of-Flight and precision time stamping using L-3 Oceania HPTR device, 1 ms accuracy with better than 1 ns (0.5 ppb) stability.
- Doppler to +/- 80 knots (increases power consumption)
- Customised I/O interface protocol, sensor interface, command and control
- Ultra low power (less than 0.009 W) deep sleep for long term deployments (quiessent current less than the leakage current of 5 to 7 year shelf life alkaline batteries)
- Longer communication ranges available:
  - High Power 2 kW 194 dB μPa ceramic (uses standard Power Amplifier)
  - Very High Power 3 kW 200 dB μPa ceramic (requires 2.5 kW Power Amplifier)
- Built-in Acoustic Release
- Private communication channel encoding or crypto
- 100 mm transpond or range pulse distance measurement (requires HPTR)
- 200 Wh Rechargeable battery pack with longer barrel
- 500 Wh Alkaline battery pack with longer barrel
- 2500 Wh Alkaline battery pack in a 950 mm (37.8 in) x 244 mm (9.6 in) pressure housing
- Network Access Communication Layer for relaying messages (extends communication range beyond 25-45 km and allows communication around obstructions)

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**Encoding**
- MASQ Digital Data (multi channel DSSS)

**Power**
- TD10 Omni-directional transducer gives 160-190.5 dB re 1uPA @1 m

**Baud Rate**
- 10-1000 (raw rate, allow 20% for error correction and protocol overhead)

**Doppler**
- +/- 15 knots (options to go higher versus power consumption)

**Maximum Range**
- Maximum range under good conditions (calm and deep) at 10 baud is 45km, 50 baud is 35 km and 1000 baud is 14 km. Actual range obtained will depend on deployment and environmental conditions.

**Minimum SNR**
- Up to -9 dB

**Encoding**
- STANAG 1074 compliant UQC with configurable power, carrier, bandwidth and side bands

**Power**
- TD10 Omni-directional transducer gives 160-192 dB re 1uPA @1 m

**Maximum Range**
- Maximum range under good conditions (calm and deep) is 25 km. Actual range obtained will depend on deployment and environmental conditions.

**Diameter**
- Transducer is 160 mm (6.3 in), barrel is 100 mm (3.9 in)

**Length**
- Standard barrel is 350 mm (13.8 in), overall length 565 mm (22.2 in). Length is customisable from 250mm (10 in) with extra length required for internal battery packs.

**Operating Temp**
- 0 to 50 degrees Celsius (32 to 122 degrees Fahrenheit)

**Operating Depth**
- Aluminium/Ertalite: 1500 m and 5000 m, Titanium: 12000 m / full ocean depth

**Weight**
- 1500 m Aluminum (350 mm barrel)
  - 7 kg (15.4 lbs) in air, 3 kg (6.6 lbs) in water
- 5000 m Aluminum (350 mm barrel)
  - 12 kg (26.4 lbs) in air, 7 kg (15.4 lbs) in water
- 12000 m Titanium (350 mm barrel)
  - 18 kg (39.7 lbs) in air, 13 kg (28.6 lbs) in water

**Voltage**
- 12-48 VDC (48V required for maximum power transmissions)

**Transmit power**
- Depends on power setting, maximum 300 W

**Receive power**
- 3 W

**Sleep power**
- Sleep power less than 0.07 W (deeper sleep options available)

**Interface**
- NMEA-0183 compliant ASCII over RS232/422/485 at 1200 to 115,200 baud

**Sensors**
- Pressure and Temperature sensor built-in. Other sensors can be interfaced.