

Revolutionize Underwater Acoustic Communication

19,200 Baud, Power Efficient, Highly Robust

Underwater Acoustic Modem



Combining cutting-edge digital communication and broadband underwater acoustics, LinkQuest's extensive line of high speed underwater acoustic modems have revolutionized underwater acoustic communication. The advanced technologies have achieved:

- Dramatically improved data rate up to 19,200 bits/s
- Unprecedented reliability with bit error rate of less than 10^{-7}
- Significantly reduced power consumption

LinkQuest's modems have been widely deployed all over the world for offshore oil field applications, environmental monitoring, AUV high speed data link, AUV command and control, manned submersibles, and navy applications. Clients include Shell, Fugro GEOS, Fugro John Chance, Simrad, Boeing, Oceaneering, C&C Technologies, Global Marine Systems, NOAA PMEL, NOAA NOS, NOAA National Data Buoy Center, USGS, Japan Marine Science and Technology Center, Dunstaffnage Marine Lab (UK), CEFAS (UK), Institute of Marine Research (Norway), ENEA (Italy), The University of Maryland, Virginia Institute of Marine Science, Pennsylvania State University, the US Navy, and the Spanish Navy.

- ❑ Transports over 95% of world's acoustic communication data
- ❑ World record of uploading five gigabytes of data from a single pair of modems in a year
- ❑ World's only long term high speed acoustic communication from offshore drilling DP vessels
- ❑ Over sixty successful deployments with ADCPs
- ❑ Dominant supplier to world's most advanced AUVs
- ❑ Unmatched customer satisfaction manifested by a long list of highly reputable clients.

MAIN FEATURES

- A modem pair forms a completely transparent wireless RS-232 connection
- No need to modify instrument software
- Most advanced high speed digital modem technology
- State of the art DSP technology
- Broadband transducer technology
- Sophisticated two-way communication protocol
- Reduced cost, easier maintenance and better reliability over conventional cable communications
- Intergrated with LinkQuest's *TrackLink* USBL tracking system

SYSTEM FEATURES

- *Acoustic Broadband Spread Spectrum* technology
- Advanced hybrid modulation scheme
- Channel equalization to combat multipaths
- Highly effective Error correction coding
- Automatic rate adaptation
- Horizontal and vertical environments



JAMSTEC uses LinkQuest acoustic modems to collect current data from moored ADCP periodically.



C&C Technologies uses LinkQuest acoustic modems to upload images from sidescan sonar and sub-bottom profiler on Hugin 3000 AUV



Shell uses LinkQuest acoustic modems to monitor the currents near the bottom of offshore oil platform Ocean Worker in real-time

Underwater Acoustic Modem Models

UWM1000



- RS-232 data rate: 9600 bits/second
- Payload data rate: 7000 bits/second
- Acoustic link: 17.8k bits/second
- Bit error rate: less than 10^{-7}
- Transmit mode power consumption: 1 Watt
- Receive mode power consumption: 0.75 Watt
- Sleep mode power consumption: 8 mW
- Beam width of transducer: 120 or 70 degrees
- Operating frequency: 26.775 to 44.625 KHz
- Working range: 350 m
- Maximum depth: 200 m
- Voltage: 9V - 24V
- Overall length: 235.7 mm
- Housing diameter: 87.2 to 126.2 mm
- Weight out of water: 4.2 kg
- Weight in water: 2.3 kg
- Optional data rate: 19200 baud

UWM2000



- RS-232 data rate: 9600 bits/second
- Payload data rate: 6600 bits/second
- Acoustic link: 17.8k bits/second
- Bit error rate: less than 10^{-7}
- Transmit mode power consumption: 4 Watts
- Receive mode power consumption: 0.8 Watt
- Sleep mode power consumption: 8 mW
- Beam width of transducer: 60 degrees
- Operating frequency: 26.775 to 44.625 KHz
- Working range: 1500 m
- Maximum depth: 200 m (surface unit) 1000 m (bottom unit)
- Voltage: 9V - 24V
- Overall length: 252.4 mm
- Housing diameter: 87.2 to 126.2 mm
- Weight out of water: 5.1 kg
- Weight in water: 2.7 kg
- Optional data rate: 19200 baud

UWM3000



- RS-232 data rate: 2500 bits/second
- Payload data rate: 2000 bits/second
- Acoustic link: 5000 bits/second
- Bit error rate: less than 10^{-7}
- Transmit mode power consumption: 3 or 12 Watts
- Receive mode power consumption: 0.8 Watt
- Sleep mode power consumption: 8 mW
- Beam width of transducer: 210 degrees
- Operating frequency: 7.5 to 12.5 KHz
- Working range: 3000 m
- Maximum depth: 700, 3000 or 6000 m
- Voltage: 18V - 28V
- Overall length: 410 mm
- Housing diameter: 140 mm
- Weight out of water: 6.7 kg
- Weight in water: 4.1 kg
- Optional data rate: 5000 baud

UWM4000



- RS-232 data rate: 4800 bits/second
- Payload data rate: 3200 bits/second
- Acoustic link: 8500 bits/second
- Bit error rate: less than 10^{-7}
- Transmit mode power consumption: 7 Watts
- Receive mode power consumption: 0.8 Watt
- Sleep mode power consumption: 8 mW
- Beam width of transducer: 80 degrees
- Operating frequency: 12.75 to 21.25 KHz
- Working range: 4000 m
- Maximum depth: 3000 m or 6000 m
- Voltage: 12V - 28V
- Overall length: 286 mm
- Housing diameter: 144 mm
- Weight out of water: 8.2 kg
- Weight in water: 4.6 kg
- Optional data rate: 9600 baud

UWM7000:

Payload Data Rate: 2000 bits/s
Maximum Depth: 7000 m
Working Range: 10000 m

MODELS TAILORED FOR AUV APPLICATIONS

UWM4010: AUV High Speed Data Link

Based on UWM4000 with a link layer protocol tailored for AUV high speed image data transfer and synchronization schemes to resolve acoustic interference.

UWM3010: AUV Command and Control

Based on UWM3000 with increased transmission power to 35 watts and a low profile mechanical housing for easy installation on AUV and tow fish.

COMMON SPECIFICATIONS

- RS-232 Configuration: 9600 baud, 1 start bit, 1 stop bit, no parity bit, and no flow control
 - RS-232 input data buffer: 900K bytes
 - Operating temperature: -2 to 45 °C
 - Storage temperature: -5 to 75 °C

LinkQuest Inc.

Tel: (858) 623-9900 Fax: (858) 623-9918

6339 Nancy Ridge Drive • San Diego, CA 92121

Email: sales@link-quest.com • <http://www.link-quest.com>