UNDERWATER COMMUNICATION & NAVIGATION
L A B O R A T O R Y

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uWAVE USBL Underwater acoustic modem specifications
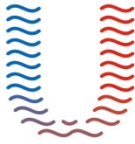
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KEY FEATURES

- **Extremely small size and weight**
- **Simultaneous data transmission & USBL navigation**
- **Reliable data transmission with 78 bit/s**
- **Operating range up to 1000 m**
- **Subscribers code division**
- **Propagation time measurement**
- **Reliable and noise-immune technology of digital broadband acoustic communication**
- **Low power consumption (Rx/Tx) 0.33/6 W**
- **Open & easy interfacing protocol**
- **Built-in depth/temperature sensor**

uWAVE USBL Modem - a device that combines the functions of transmitting data through a underwater acoustic channel and a navigation system on an ultra-short base.

Using **uWAVE USBL Modems**, the user can:

- transfer arbitrary user data between **uWAVE USBL Modem**, **uWAVE Max** and **uWAVE** modems in any combination with the simultaneous estimation of the horizontal angle of arrival;

- estimate the location of the **uWAVE USBL Modem**, **uWAVE Max** and **uWAVE** modems in command mode by slant range and horizontal angle of arrival;

- transmit up to 9 short code telecontrol user commands;

- request from remote modems **uWAVE USBL Modem**, **uWAVE Max** and **uWAVE** their depth, temperature and voltage;

- measure own depth, temperature and voltage;

uWAVE family devices use a simple open NMEA-like configuration protocol, and the supplied open-source **uWAVELib** library allows for the fastest and easiest integration of devices into user solutions.

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26.03.2020 15:53:51

TECHNICAL SPECIFICATIONS

DIMENSIONS (Φ x h)	**64 x 128 mm**
WEIGHT (dry)	**0.44 kg**
DEPTH RATING	**300 m**
MAX OPERATING RANGE	**3000[1] m**
PAYLOAD DATA RATE	**78 bit/s**
POWER CONSUMPTION Rx/Tx	**0.33/25 W**
HORIZONTAL ANGLE OF ARRIVAL ESTIMATION ACCURACY (typ.)	**1°**
SUPPLY VOLTAGE	**12 V**
DATA LINES VOLTAGE	**0 .. 3.3 V**
FREQUENCY BAND	**10 .. 30 kHz**
BIT ERROR RATE	**10^{-6}**
SNR[2]	**-2 dB**
MAX RELATIVE VELOCITY	**+/- 1 m/s**
RATED STARTUP TIME	**100 msec**
WORKING TEMPERATURE RANGE	**-5 .. 50 °C**
INTERFACE[3]	**UART 9600 bit/s**
INTERFACING PROTOCOL	**NMEA 0183 PUWV**
WIRE LENGTH[4]	**1 m**
SUBSCRIBERS CODE DIVISION	**20 code channels**
COMMAND MODE	**16 predefined code messages (9 for user applications)**

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[1] While working with uWAVE USBL Modem or uWAVE Max. Max operating range with uWAVE modems is 1000 m.
[2] This value is obtained without the presence of the multipath effect
[3] Can be changed by the special request
[4] Can be changed by the special request