



# VR4-UWM (Underwater Modem)

## Flexible receiver for remote monitoring and communicating



**The VR4 Underwater Modem (VR4-UWM) Receiver** is a submersible receiver capable of identifying all VEMCO coded transmitters (both 69 kHz and 180 kHz tags) and communicating remotely to a surface modem. The VR4-UWM is designed to be a flexible and reliable means of recording fish telemetry data and then transmitting the stored data to a surface unit on demand. It is ideal for site residency and migratory studies involving many animals over an extended period and is suitable for offshore deployments or in deeper water.

### Proven Technology

Based on the proven technology of the VR2W, the VR4-UWM can store more than 800,000 detections. It can be deployed and left undisturbed for more than 6 years so you can get data quickly without having to retrieve and redeploy your receivers. As the successor to the VR3-UWM, the VR4-UWM boasts numerous enhancements over its predecessor such as greater depth rating, more memory and the ability to detect all VEMCO transmitters.

### Simple to Use

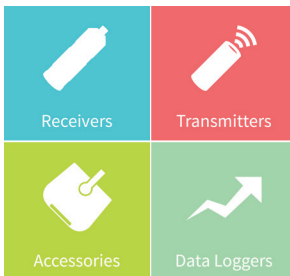
The VR4-UWM records the identification number and time stamp from acoustic transmitters as a tagged animal travels within the receiver's acoustic range. Tag depth, temperature or acceleration data can also be collected. Data is loaded to a computer in the field without retrieving the receiver by using an underwater modem system. A surface modem unit uses VUE software to communicate with the deployed unit and store the recorded data to a file on the computer at the water's surface.

### Key Features

- ▶ Approximately 1100 Baud data rate
- ▶ Omnidirectional modem eases station keeping while communicating with the modem
- ▶ Maximum depth rating of 500 metres
- ▶ Dual channel frequencies of 69 kHz and 180 kHz
- ▶ Receiver channels can be independently switched on or off to save power and significantly extend battery life



- ▶ All receiver functions can be switched off to save power during shipping and storage without removing the battery or opening the case
- ▶ Fast acoustic "wake up" enables modem communication in less than 30 seconds
- ▶ Battery monitoring measures charge drawn from the battery and keeps track of used/re-remaining capacity in the battery
- ▶ > 6-year battery life
- ▶ Stores > 800,000 detections
- ▶ Visible LEDs for status indication
- ▶ Bluetooth® wireless interface for in-lab configuration
- ▶ External Instrument Port (optional) used to communicate with a co-located third-party instrument with an RS232 interface
- ▶ Secondary waterblock for hydrophones that prevents flooding of the main case if a hydrophone is broken
- ▶ Password protection



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## Physical Specifications

|   |   |
|---|---|
| Dimensions  | Height = 50.3 cm                          |
|   | Diameter = 22.2 cm                        |
| Weight (with battery)   | Alkaline = 13.2 kg in air; 2.99 in water  |
|   | Lithium = 12.3 kg in air; 2.1 kg in water |
| Estimated Battery Life - 69 kHz channel only enabled              | Alkaline = 31 months                      |
|   | Lithium = 118 months                      |
|   | SAFT Battery Pack = 100 months            |
| Estimated Battery Life - 180 kHz channel only enabled             | Alkaline = 22 months                      |
|   | Lithium = 85 months                       |
| Estimated Battery Life - both 69 kHz and 180 kHz channels enabled | Alkaline = 19 months                      |
|   | Lithium = 72 months                       |
|   | SAFT Battery Pack = 60 months             |
| Maximum Depth   | 500 meters                                |
| Dual Receive Frequency  | 69 kHz and 180 kHz                        |
| Memory  | > 800,000 detections                      |

Battery life estimates are based on typical usage of downloading 100 Kbytes of data per month over the acoustic modem. More frequent offloads and larger data records will decrease the life expectancy of the battery.

### Non-Volatile Memory

The VR4-UWM has non-volatile memory and more than 800,000 detections can be stored in memory. Because non-volatile memory is used, the data remains intact even with the loss of battery power.

### Underwater Communication

The VR4-UWM receiver has an underwater modem transducer to allow underwater communication. Another underwater modem transducer is deployed at the surface (referred to as the surface modem) and is used to communicate with the bottom modem transducer. This allows the data stored in the VR4-UWM to be loaded to a computer at the water's surface without having to retrieve the receiver.



The VR4-UWM consists of two acoustic receivers, underwater modem, ID detector, data logging memory, and battery all housed in a submersible case. The acoustic modem embedded in the VR4-UWM is a Benthos Inc. Band C Compact Modem. It operates in conjunction with the Benthos UDB-9000 Band C Deck Box and transducer. An external RS-232 serial interface is available as a factory option. This is a "pass through" port that allows the acoustic modem to communicate with supported third party instruments. Currently, only the Satlantic Benthic Pod instrument cluster is supported in VUE.



Benthos Deck Box

### Operates with VUE Software Version 2.0 or Greater

The VEMCO User Environment (VUE) PC Software for initialization, configuration and data upload from VEMCO receivers allows users to combine data from multiple receivers of varying types into a single integrated database. Studies using 69 kHz and 180 kHz tags can also be combined into one VUE database. The VR4-UWM Comm Package includes VUE software, software manual, two VR4-UWM Comm Keys, an adapter for USB to Bluetooth® wireless technology, and a USB to serial adapter to connect to the Deck Box.



A research team deploys a VEMCO VR4-UWM receiver which is encased in a flotation collar made by Kintama Research.

