

# TR-ORCA

## UNDERWATER DATA ACQUISITION



## CAPTURE, RECORD, & PROCESS IN REAL TIME.

TR-Orca is an underwater data acquisition and recording instrument that supports multiple input channels and extremely high sampling rates so that it can be used to capture, record and process, in real time, the richest underwater data sets possible. TR-Orca supports five synchronously sampled analog and hydro-phone inputs in its standard configuration.

Sampling rates are configurable up to 768 kHz with 1 TB of internal solid state storage. This product features an open Application Programming Interface (API) so that researchers and scientists are free to program the electronics with their own custom algorithms, or use Turbulent Research's constantly growing library supporting spectral analysis, detection, directional signal processing and more to build unique applications.

This underwater instrument is easy to use, deploy and configure, while at the same time is flexible enough to be useful in almost any underwater measurement and real time signal processing scenario. Record and process data autonomously, or stream data or messages real time over Ethernet or serial interfaces. The base electronics supports super low noise front end circuitry, as well as optimized hardware for underwater, low power, recording and signal processing. This instrument not only lets users record pristine data sets, but also allows them to develop their own real time underwater instruments.



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Turbulent Research designs and develops marine electronics products for rich & robust real time data acquisition and signal processing. Our company was founded by engineers with a passion for design, signal processing and delivering world class products.



## KEY FEATURES

- **MULTIPLE SYNCHRONOUSLY SAMPLED**  
Input Channels
- **FLEXIBLE SAMPLING RATES**  
from 24 KHz to 768 KHz
- **SUPPORTS MULTIPLE SENSOR TYPES:**  
Hydrophones, Vibrational Sensors, Seismic Inputs
- **DEEP SOLID STATE RECORDING**
- Open API For Users to Program  
**CUSTOM ALGORITHMS IN REAL TIME**
- **LOW POWER CONSUMPTION**  
for Long Deployments
- **REAL TIME DATA STREAMING**  
or Messaging over Ethernet or Serial Interfaces

## PRODUCT APPLICATIONS

Acoustics Detection, Localization and Classification  
 Marine Mammal Studies and Real Time Monitoring  
 Multi Sensor Ocean Observation  
 Ambient Noise Monitoring  
 Wind And Tidal Renewable Energy Monitoring

## TECHNICAL SPECIFICATIONS

**POWER** Internal Power: 72 Alkaline D Cells (user replaceable)

External Power: 10-18 V DC

USB Power: 5 V DC

Average Power Consumption: 300 mW – 3W (depending on use)

**ANALOG INPUT CHANNELS** Number of Channels: 5 – Standard (more available on request)

ADC Number of Bits: 16 – Standard (24 bit version available on request)

Dynamic Range Per Channel: 95.5 dB  
(full bandwidth, better at lower sampling rates)

Sampling Rates Supported:  
24 KHz, 48 KHz, 96 KHz, 192 KHz, 384 KHz, 768 KHz

**HYDROPHONE OPTIONS** Can be used with multiple hydrophone vendors

Hydrophones mounted on end cap, or connectorized with custom cable lengths

Customized sensitivities and bandwidths available on request

**MEMORY** Integrated 1 TB SD Card and 2 TB Solid State Drive for Standard version  
(Fat32 Formatted File System .wav) (customized options available)

Configurable recording, schedule and duty cycling

**COMMUNICATIONS** Ethernet

High Speed USB for Download

RS422 (232 available with external converter) for real time monitoring

Bluetooth for setup and configuration with Android Phone or Tablet

**ENVIRONMENTAL** 750m and 2500m depth standard (deeper options available on request)

Material Delrin or Anodized Aluminum or Titanium

Operating Temperature: -10°C to +50°C

*\*Specifications subject to change without notice.*

