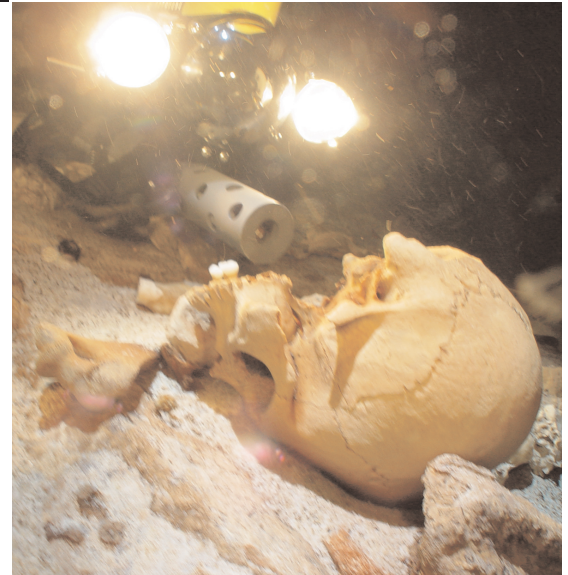


PROGRAM INFORMATION

ACADEMIC & RESEARCH PROGRAM



VIDEORAY ACADEMIC & RESEARCH PROGRAM

VideoRay is proud to support University students and researchers worldwide who are developing new capabilities for unmanned underwater vehicles. The products offered under this program are designed for university-level students and researchers in underwater robotics design. They require an electrical engineering background and additional "project box" parts to complete. The kit is designed to be used in experimenting with different vehicle control or sensor capabilities, through custom-developed software, hardware, or both. Qualified interested parties can benefit from reduced pricing, and not having to spend time and budget on developing a custom platform for advanced applications.



ACADEMIC & RESEARCH KIT

Components:

Stock VideoRay Pro 4 Submersible
20 m Neutrally Buoyant Performance Tether
Control Box Parts Kit (Unassembled)

System Requirements (User Supplied):

PC / Control Interface
Monitor

www.videoray.com

580 Wall Street Phoenixville, PA 19460 USA
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PROGRAM INFORMATION



The product contains a fully assembled and tested stock VideoRay Pro 4 submersible vehicle, 40 meters of neutrally buoyant performance tether and a kit of all the parts and connectors you need to construct a control box. It requires a user supplied PC, and possibly a standard game controller, in order to interface to and pilot the ROV.

The kit is designed to be used in experimenting with different vehicle control or sensor capabilities, through custom-developed software, hardware, or both. The resulting projects will likely not be capable of field deployment without additional development. If this is contemplated, the mounting, grounding, heat sinking, waterproofing, and general safety considerations of outdoor underwater instruments must be THOROUGHLY investigated and implemented by the researcher.

It is important to understand the philosophy of the VideoRay Cockpit control required for this kit. This is the software that controls our Pro 4 submersible systems, which are documented on our web site. The most important aspect of the Pro 4, from a research standpoint, is the software development kit that is designed to provide easy access to modify and enhance the code which controls the submersible and reports on its sensors.

The PRO4 host SDK (developed in C#) is provided as a set of .Net assemblies. All ROV platform control is included, as is standard piloting user interface. Additional support features, such as generic user interface components and standard oceanographic functions (such as pressure to depth conversions) are included. A plug-in infrastructure is provided. This allows the graphical interface as well as command, control, and communication subsystems to be augmented. All protocols and data formats are documented for easy data communication and export.

An embedded software development kit is also available. The software running on board the ROV and on accessory payloads developed using the PAM or other modules is based upon the same code library. This embedded SDK is written in GNU C (using the winAVR compiler package). Individual embedded applications are statically linked against this library.

In addition to the access to this modern software, you will be able to easily add additional sensors or actuators onto the submersible with the available VideoRay Protocol Adapter Multiplexer (PAM) board. This small electronics module (38 x 38 millimeter) and associated software kit facilitates the development of new payloads and accessories. The PAM acts as an interface adapter between the PRO4 RS-485 bus and a secondary serial bus (RS-232, TTL, or RS-485). Software on board the PAM handles all packetization, arbitration, handshaking, etc. The PAM provides a method of seamless transparent integration with almost any low-bandwidth device.

The PAM also enables development of custom sensor packages. In addition to the serial communication interfaces, there are several analog to digital converter channels and general purpose digital IO. There is also hardware and generic software support for driving servomotors, DC motors, solenoids, and relays.

Using VideoRay's VideoRay Cockpit software and SDK, it is possible to provide inputs to the VideoRay controls – horizontal thrusters, vertical thrusters, camera tilt and focus, manipulator, lights, front/rear camera, etc. Programmers can integrate other external applications such as sonar data viewers, video capture, external and internal sensor readings, database storage, etc. They can also increase the autonomy of the submersible by controlling some or all of the functions through program inputs. If a host processor and power supply is carried along with the VideoRay, the ROV can be made completely autonomous.