



**Sveučilište u Rijeci, Pomorski fakultet**  
University of Rijeka, Faculty of Maritime Studies

# CENTER FOR MARINE TECHNOLOGIES EQUIPMENT CATALOG



# CENTER FOR MARINE TECHNOLOGIES

## EQUIPMENT CATALOG

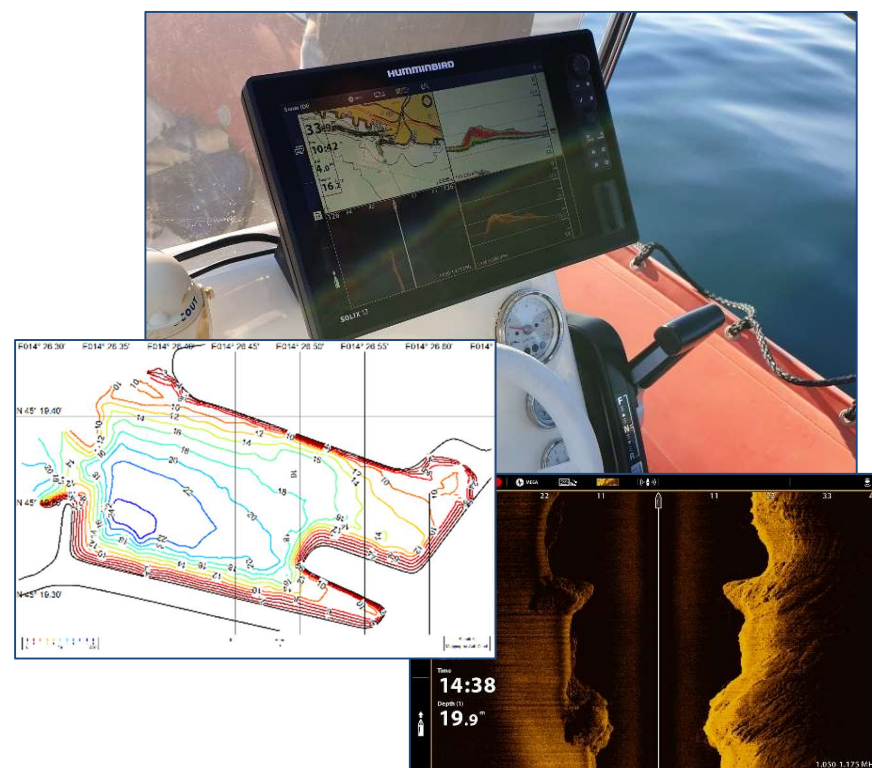


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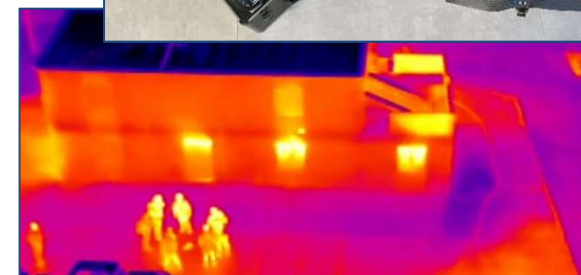
<b>Equipment</b>	<b>Underwater drone Blueye Pioneer</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Maritime Studies
<b>Short description and examples of use</b>	<p>Remotely operated underwater vehicle for high resolution video and photo recording. The drone is equipped with a light-sensitive camera and LED lights for recording at great depths or during night. It has four thrusters which allow it to move quickly and precisely in all directions. The drone has the automatic depth and heading (course) function, which facilitates the operation in demanding conditions or when the precision is needed.</p> <p>Examples of use: underwater ship's hull inspection, port structure inspection (docks, breakwaters, terminals, etc.), seabed inspection, inspection of mooring equipment in marinas, wreckage conditions, reef monitoring, inspection of pipelines, cables, drains and other facilities or structures at sea.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Dimensions: 485 x 257 x 354 mm (LxWxH)</li> <li>• Operating depth: 150 m</li> <li>• Speed: 1.5 m/s (3 knots)</li> <li>• Camera: FHD with a wide-angle lens 1080p/30 fps</li> <li>• Light: LED - 3300 lumens</li> <li>• Sensors: echo sounder, magnetometer (compass), temperature</li> <li>• Thruster power: 4 x 350 W</li> <li>• Estimated battery life: 2 hrs.</li> </ul>
<b>Additional information</b>	<a href="https://www.blueyerobotics.com/products/pioneer">https://www.blueyerobotics.com/products/pioneer</a>
<b>Funding</b>	EU InterReg project AdriREEF
<b>Contact</b>	Lovro Maglić, Ph.D, e-mail: <a href="mailto:maglic@pfri.hr">maglic@pfri.hr</a>



<b>Equipment</b>	<b>Side scan sonar Humminbird SOLIX 12</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Maritime Studies
<b>Short description and examples of use</b>	<p>Sonar SOLIX 12 is used for underwater depth measuring and imaging. It consists of a control head unit with 12" screen and underwater CHIRP transducer. The Sonar can scan the seabed using Down Imaging i.e. creating „portrait“ seabed image below the ship/boat or using Side Scan providing a side-to-side perspective i.e. scans the area to the left and right of the boat location. The sonar can use three frequencies (455 kHz, 800 kHz and 1100 kHz) depending on actual depth. With the sonar and AutoChart program the seabed can be analyzed and live bathymetry charts can be generated.</p> <p>The sonar may be used for: fish detection and size estimation, detection and recognition of different underwater structures (wrecks, reefs, pipelines, etc.), estimation of seabed type and hardness, detection and estimation of seabed vegetation presence, hydrographic measurements, creating bathymetric charts and 3D charts of the scanned area.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>TFT 12" screen 1280x800 - NMEA 0183 Bus, NMEA 2000 Bus; Transducer CHIRP MEGA SI+; GPS.</li> <li>SIDE IMAGING Range - 455 kHz: 244 m; 800 kHz: 76 m; MEGA Imaging+: 122 m, Ranges indicate Side to Side.</li> <li>SIDE IMAGING Coverage Area - 455 kHz: (2) 86°; 800 kHz: (2) 55°; MEGA Imaging+: (2) 86°.</li> <li>DOWN IMAGING Depth - 455 kHz: 122 m; 800 kHz: 38 m; MEGA Imaging+: 61 m.</li> <li>DOWN IMAGING Coverage Area - 455 kHz: 75°; 800 kHz: 45°; MEGA Imaging+: 75°.</li> </ul>
<b>Additional information</b>	<a href="https://www.humminbird.com">https://www.humminbird.com</a>
<b>Funding</b>	EU InterReg project AdriREEF
<b>Contact</b>	Lovro Maglić, Ph.D, e-mail: <a href="mailto:maglic@pfri.hr">maglic@pfri.hr</a>



Equipment	<b>Unmanned Aircraft System JAZZ-Octocopter 1100</b>	
Affiliation	University of Rijeka, Faculty of Maritime Studies	
Short description and examples of use	<p>The unmanned Aircraft System (UAS) is powered by eight electric motors, allowing flight operations with a maximum take-off weight of 7.16 kg. The UAS is equipped with a GPS module enabling precise and wanted positioning. The UAS is equipped with a professional action and thermal camera for high resolution video and photo recording. On the UAS can be integrated different sensors, like <b>Velodyne LiDAR Puck</b> used for mapping of surrounding area and object detection and <b>Sniffer4D Hyper-local Mobile Air Quality Mapping System</b> used for measuring air quality, concentration of chemical compounds and their dispersion. The flight time of the UAS is approximately 12 to 15 minutes, depending on flight conditions and the number of additional equipment.</p> <p>Examples of use: the taking high-quality photo and video recordings of fixed and mobile land or sea objects, which can be used for further photo and video analysis; area mapping and object detections; determining air quality and concentration of chemical compounds and their dispersion, other measuring depending on the mounted sensors.</p>	
Technical specifications	<ul style="list-style-type: none"> <li>• Dimensions: 1.100 (Diameter) x 500 mm (Height).</li> <li>• No. of electromotors/Batteries: 8; 2xLi-Ion 10.000 mAh (5S).</li> <li>• Maximum Take-Off Weight: 7.16 kg.</li> <li>• Max. flight (without wind)/Ascent-Descent speed: 14 m/s; 3 m/s.</li> <li>• Max. Pitch angle/Angular velocity: 25°; Pitch: 200°/s; Yaw: 100°/s.</li> <li>• Max. Flight Altitude above Sea Level: 1.500 m.</li> <li>• Flight Time: 12-15 min.</li> <li>• Hovering Accuracy (GPS): Vertical: <math>\pm 0.5</math> m; Horizontal: <math>\pm 1.5</math> m.</li> <li>• (Thermal) camera: 1080p 60fps, 1080p 30fps, 720p 60fps.</li> </ul>	
Additional information	N/A	
Funding	University of Rijeka, Faculty of Maritime Studies	
Contact	<p>Tomislav Krljan, MSc, e-mail: krljan@pfri.hr</p> <p>Neven Grubišić, Ph.D, e-mail: neven.grubisic@pfri.uniri.hr</p>	





<b>Equipment</b>	<b>Unmanned aerial vehicles DJI Phantom 4 Pro and DJI Phantom 4 Advanced</b>	
<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering	
<b>Short description and examples of use</b>	<p>Unmanned aerial vehicles are used for taking high quality aerial photos and video recordings. They are powered by 4 propellers, with the possibility of three-way camera stabilization (from - 90° to + 30°). Satellite positioning is provided by GPS and GLONASS systems. The flight time of both aircrafts is approximately 30 minutes, depending on the flight conditions. The DJI Phantom 4 Advanced is 20 grams lighter than the Phantom 4 Pro and has fewer obstacle avoidance sensors.</p> <p>Phantoms are used for taking photographs and video recordings from the air for the purpose of creating precise 3D digital models of terrain and objects.</p>	
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Mass Phantom 4 Pro / 4 Advanced: 1388 g / 1368 g</li> <li>• Battery: 6000 mAh LiPo (2S)</li> <li>• Maximum speed: 72 km/h</li> <li>• Maximum inclination angle/angular velocity: 42°; 250°/s;</li> <li>• Maximum flight altitude: 6000 m</li> <li>• Resistant to maximum wind speed of 10 m/s</li> <li>• Maximum flight duration: approx. 30 min</li> <li>• Sensor dimensions: 1"</li> <li>• Sensor resolution: 20 M</li> <li>• Shutter: electronic 1/8000 s, mechanical 1/2000 s</li> <li>• Video resolution: 4K:3840×2160 24/25/30p @100Mbps</li> </ul>	
<b>Additional information</b>	<a href="https://www.dji.com/hr/phantom-4-pro/info">https://www.dji.com/hr/phantom-4-pro/info</a>	
<b>Funding</b>	NP Plitvice Lakes, project „Monitoring of morphological changes of the course of the Korana River (from the third Korana waterfall to Sastavci)“	
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: iruzic@gradri.uniri.hr	



<b>Equipment</b>	<b>Velodyne LiDAR Puck</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Maritime Studies
<b>Short description and examples of use</b>	<p>Velodyne LiDAR (Light Detection and Ranging) device is based on emitting laser light pulses in the surroundings obtaining distances to the targets by measuring the time of reflection the light takes to return to the sensor. Velodyne LiDAR Puck has a range of 100 m and generating about 300,000-600,000 (not)georeferenced points/seconds in real-time. The result is the capability to create high-quality 3D models of the surroundings (targets). The sensor has 360° horizontal and 30° vertical field of view, providing a wide range and high precision. Velodyne LiDAR Puck can be used as an independent stationary unit, as a mobile unit mounted on a vessel (land or sea) or it can be integrated with the <b>UAS JAZZ-Octocopter 1100</b>.</p> <p>Examples of use: area mapping (development of 3D models), object (obstacle) detection on land and/or water in the function of navigation, obstacle avoidance, adaption of movement in accordance with traffic conditions, data postprocessing with various graphical and simulation software.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Dimensions/Mass: 103 mm (Diameter), 72 mm (Height); 830 g.</li> <li>• Sensor Measurement Range: <math>\leq 100</math> m.</li> <li>• Horizontal/Vertical Sensor field of view: 360°; 30°.</li> <li>• Sensor accuracy: <math>\pm 3</math> cm.</li> <li>• Sensor rotation rate: 5-20 Hz.</li> <li>• Laser (wavelength): 903 nm.</li> <li>• Single/Double Return Mode: ~300.000;~600.000 points/s.</li> </ul>
<b>Additional information</b>	<a href="https://velodynelidar.com/products/puck/">https://velodynelidar.com/products/puck/</a>
<b>Funding</b>	University of Rijeka, Faculty of Maritime Studies
<b>Contact</b>	<p>Tomislav Krljan, MSc, e-mail: <a href="mailto:krljan@pfri.hr">krljan@pfri.hr</a></p> <p>Neven Grubišić, Ph.D, e-mail: <a href="mailto:neven.grubisic@pfri.uniri.hr">neven.grubisic@pfri.uniri.hr</a></p>





<b>Equipment</b>	<b>Sniffer4D Hyper-local Mobile Air Quality Mapping System</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Maritime Studies
<b>Short description and examples of use</b>	<p>Sniffer4D Hyper-local Mobile Air Quality Mapping System is a device used for a mobile or stationary measuring of air quality and the chemical compounds concentration and dispersion. The device is equipped with NO<sub>2</sub>, CO, SO<sub>2</sub>, VOCs, and PM<sub>2.5,10</sub> electrochemical sensors. The combination of electrochemical sensors can be adjusted according to the individual requirements. The device is equipped with a positioning module enabling georeferenced dataset collection and visualization on interactive maps using Sniffer4DMapper software. Sniffer4D Hyper-local Mobile Air Quality Mapping System can be used as an independent stationary unit, as a mobile unit mounted on a vessel (land or sea) or it can be integrated with the <b>UAS JAZZ-Octocopter 1100</b>.</p> <p>Examples of use: measurements of chemical compounds concentration and dispersion of on different heights on land or sea, detection of excessive concentration of chemical compounds, mapping of detected compound concentrations and air quality.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Dimensions/Mass: 150x148x50 mm (LxWxH); 350 g.</li> <li>• Sensors (electrochemical): NO<sub>2</sub>, CO, SO<sub>2</sub>, VOCs, PM<sub>2.5,10</sub>.</li> <li>• Time resolution: 1 s.</li> <li>• Temperature, humidity, and pressure sensor.</li> <li>• Theoretical resolution: 0.1 °C, 0.1 %, 0.01 kPa.</li> <li>• Communication range (open areas, urban areas): 3-5 km, 1-2 km.</li> <li>• Positioning module (GPS, Beidou, GLONASS) accuracy: ± 2 m.</li> <li>• Data Storage: &gt; 4100 h, 16 GB.</li> </ul>
<b>Additional information</b>	<a href="https://www.soarability.tech/sniffer4d_software_en">https://www.soarability.tech/sniffer4d_software_en</a>
<b>Funding</b>	University of Rijeka, Faculty of Maritime Studies
<b>Contact</b>	<p>Tomislav Krljan, MSc, e-mail: <a href="mailto:krljan@pfri.hr">krljan@pfri.hr</a></p> <p>Neven Grubišić, Ph.D, e-mail: <a href="mailto:neven.grubisic@pfri.uniri.hr">neven.grubisic@pfri.uniri.hr</a></p>



<b>Equipment</b>	<b>Digital cameras with underwater housing: Olympus TG-2 and Olympus TG-6</b>	
<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering	
<b>Short description and examples of use</b>	<p>The Olympus TG-2 and TG-6 digital cameras are resistant to any weather conditions. They can withstand a fall from a height of 2.1 m, and they can operate at a temperature of -10 ° C. They have the possibility of shooting underwater to a depth of 15 m, and with a protective underwater housing to a depth of 45 m. Both devices are equipped with a 25 mm lens with 4x optical zoom, which provides video recordings with a maximum resolution of up to 3840 × 2160 pixels at 30 fps. The aperture for the TG-2 camera is F2.0 - F4.9 and for the TG-6 it is F2.0 - F8.0. The devices are used for photo and video shooting on land and underwater.</p>	
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Resolution: 12 million pixels</li> <li>• Sensor dimensions: 6.17 x 4.54 mm</li> <li>• Maximum photo resolution: 3968 x 2976</li> <li>• Lens range: 25 - 100 mm</li> <li>• Optical zoom: 4x</li> <li>• Aperture TG-2: F2.0 – F4.9</li> <li>• Aperture TG-6: F2.0 – F8.0</li> <li>• Video recording: YES</li> <li>• Maximum video resolution: 3840x2160 (30 fps/25 fps)</li> <li>• Built-in GPS</li> </ul>	
<b>Additional information</b>	<p><a href="https://www.imaging-resource.com/PRODS/olympus-tg2/olympus-tg2A.HTM">https://www.imaging-resource.com/PRODS/olympus-tg2/olympus-tg2A.HTM</a></p> <p><a href="https://www.imaging-resource.com/PRODS/olympus-tg-6/olympus-tg-6A.HTM">https://www.imaging-resource.com/PRODS/olympus-tg-6/olympus-tg-6A.HTM</a></p>	
<b>Funding</b>	University of Rijeka, Faculty of Civil Engineering	
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: iruzic@gradri.uniri.hr	



<b>Equipment</b>	<b>Teledyne Marine SteamPro</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering
<b>Short description and examples of use</b>	<p>Teledyne Marine SteamPro is an Acoustic Doppler current profiler (ADCP) designed for surface recording of streamflow features in rivers and canals. Based on the Doppler effect, it measures streamflow and velocity in real time sending data wirelessly to a computer. The recording takes only a few minutes and can be done from the shore. The device is equipped with a compass and a bottom tracking sensor with a range of 7 m.</p> <p>Examples of use: defining kinematic and geometric streamflow quantities in shallow rivers and canals.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Dimensions (L × W × H): 70 × 42 × 10 cm</li> <li>• Maximum bottom tracking range: 7 m</li> <li>• Maximum geometry measurement range: 6 m</li> <li>• Minimum size of the measuring cell: 2 cm</li> <li>• Measurement of water velocity up to <math>\pm 5\text{ m/s}</math></li> <li>• Accuracy: <math>\pm 1\%</math> of measured velocity <math>\pm 0.2\text{ cm/s}</math></li> </ul>
<b>Additional information</b>	<a href="http://www.teledynemarine.com/streampro?BrandID=16">http://www.teledynemarine.com/streampro?BrandID=16</a>
<b>Funding</b>	Project „Research Infrastructure for Campus-based Laboratories at the University of Rijeka“ (RISK)
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: <a href="mailto:iruzic@gradri.uniri.hr">iruzic@gradri.uniri.hr</a>



<b>Equipment</b>	<b>ADCP - Nortek SA AWAC 1MHz, four beam</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering
<b>Short description and examples of use</b>	<p>Nortek SA Acoustic Wave and Current (AWAC) profiler is a device for measuring sea current and waves in real time. It can be used to create sea current profiles and the full wave spectrum. With a maximum range for wave measurements of 35 m and surface recording at a frequency of 4 Hz, AWAC 1 MHz is a great tool for research in shallow areas.</p> <p>Examples of use: preparation of wave studies, coastal erosion studies, monitoring of short-term waves for protection of shore and canals, research of tidal currents, planning and design of new coastal structures and interventions on waterways, planning of safety measures on waterways, etc.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Maximum range (waves): 35 m</li> <li>• Maximum range (currents): 30 m</li> <li>• Velocity range: <math>\pm 10</math> m/s horizontally</li> <li>• Accuracy: <math>\pm 1\%</math> of measured value <math>\pm 0.5</math> cm/s</li> <li>• Wave range: <math>H = -15 \text{ m} - 15 \text{ m}</math>; <math>T = 0.5 \text{ s} - 50 \text{ s}</math></li> <li>• Precision/resolution <math>&lt; 1\%</math> of measured value / 1 cm</li> </ul>
<b>Additional information</b>	<a href="https://www.nortekgroup.com/products/awac-1-mhz">https://www.nortekgroup.com/products/awac-1-mhz</a>
<b>Funding</b>	Project „Research Infrastructure for Campus-based Laboratories at the University of Rijeka“ (RISK)
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: <a href="mailto:iruzic@gradri.uniri.hr">iruzic@gradri.uniri.hr</a>





<b>Equipment</b>	<b>Nortek AS, Vectrino profiler</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering
<b>Short description and examples of use</b>	<p>Vectrino profiler is a profiling velocimeter measuring 3D velocity in a water column with a sampling rate of up to 100 Hz. The basic measurement technology is a coherent Doppler processing, which is characterized by accurate data at high rates. The measurement defines three components of a velocity vector in the range of 3 cm, with a resolution of 1 mm. At the same time the distance to the bottom can be measured. The device comes with the software whose interface provides the ability to graphically display the velocity profile, standard velocity deviation, energy spectrum, as well as streamlines.</p> <p>Examples of use: primarily intended for laboratory measurements, but proved to be very useful in measuring the swash velocity on the beaches; erosion research (stress and velocities at the bottom), streamflow description and determination of streamflow around structures, wave energy monitoring, turbulence measurement.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Measured speed range: in steps from 0.1 m/s to a maximum of 3.0 m/s</li> <li>• Sampling frequency: 1 – 100 Hz</li> <li>• Accuracy: <math>\pm 1\%</math> of measured value <math>\pm 1</math> mm/s</li> <li>• Minimum range: 20 mm</li> <li>• Maximum range: up to 2 m</li> </ul>
<b>Additional information</b>	<a href="http://195.62.126.26/en/products/velocimeters/vectrino-ii">http://195.62.126.26/en/products/velocimeters/vectrino-ii</a>
<b>Funding</b>	Project „Research Infrastructure for Campus-based Laboratories at the University of Rijeka“ (RISK)
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: <a href="mailto:iruzic@gradri.uniri.hr">iruzic@gradri.uniri.hr</a>

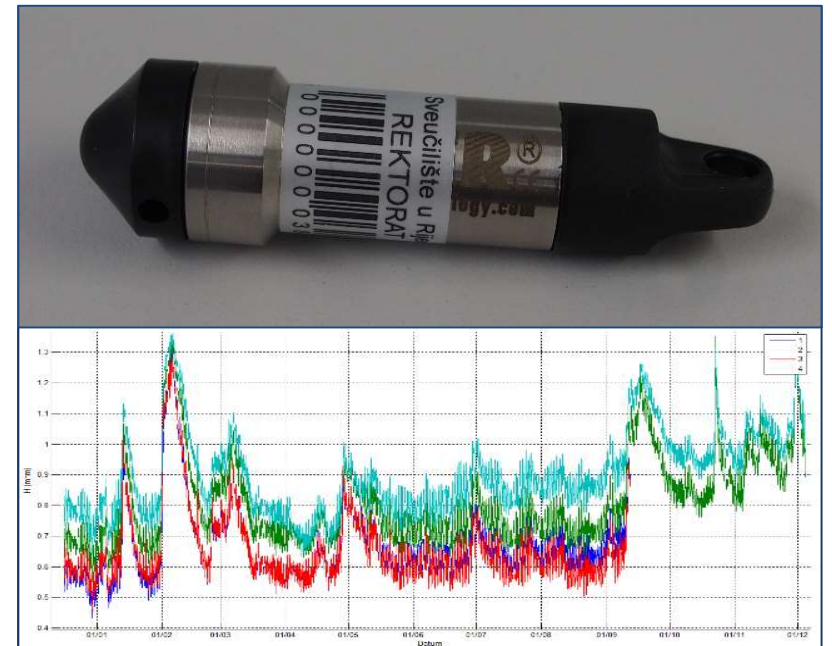




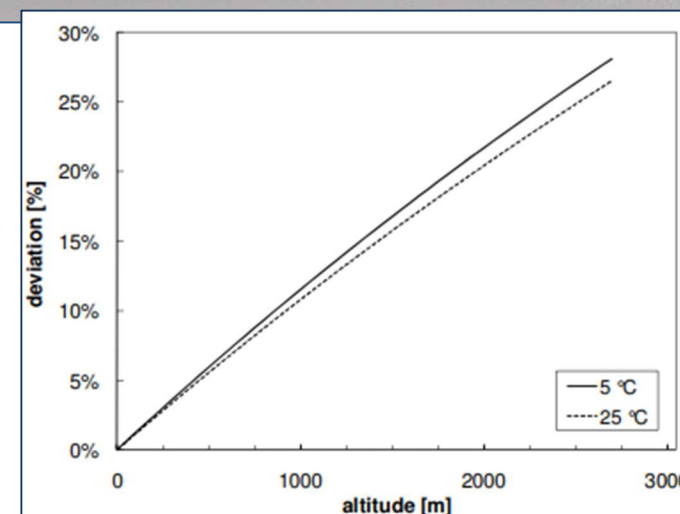
## Equipment

## Mini-Diver 10 m

<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering
<b>Short description and examples of use</b>	<p>Probe with datalogger for measuring conductivity, water level and temperature. In addition to pressure and temperature sensors, the Mini-Diver consists of a memory and battery, all housed in a 22 mm diameter housing made of 316L stainless steel (not suitable for measurements in seawater). The datalogger is autonomous and can be programmed by user. Communication between the Diver and the computer is optical; data transfer and processing are possible through <i>Diver-Office</i> software. For measurements, the device uses a pressure sensor when submerged at a fixed level below the water surface. The sensor measures the equivalent hydrostatic pressure of the water column above it (up to a maximum of 10 m) and thus calculates the total water depth. The device measures absolute pressure, so in addition to the water level, it also considers variations in atmospheric pressure at the surface.</p> <p>Usage: measuring water level changes, conductivity and temperature.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Dimensions: Ø22 mm, length 90 mm</li> <li>• Maximum measured depth: 10 m</li> <li>• Accuracy: <math>\pm 0.5</math> cm H<sub>2</sub>O</li> <li>• Range of measured temperatures: -20 °C – 80 °C</li> <li>• Precision: <math>\pm 0.1</math> °C</li> <li>• Memory capacity: 24 000 readings</li> <li>• Battery life : 8 – 10 years</li> <li>• Sampling time: 0.5 s – 99 h</li> </ul>
<b>Additional information</b>	<a href="https://www.eijkelpump-usa.com/products/sensors-monitoring/minidiver-10-meter.htm">https://www.eijkelpump-usa.com/products/sensors-monitoring/minidiver-10-meter.htm</a>
<b>Funding</b>	Project „Research Infrastructure for Campus-based Laboratories at the University of Rijeka“ (RISK)
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: <a href="mailto:iruzic@gradri.uniri.hr">iruzic@gradri.uniri.hr</a>



<b>Equipment</b>	<b>CTD-Diver</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering
<b>Short description and examples of use</b>	<p>Submersible datalogger for long-term and continuous real time groundwater level monitoring, detection of salt water intrusion and chemical discharges. It measures water temperature and electrical conductivity as well. It is 22 mm in diameter, and the 135 mm long robust ceramic housing is corrosion resistant and suitable for use even in the seawater. It uses a pressure sensor for measurements when submerged at a fixed level below the water surface. The sensor measures the equivalent hydrostatic pressure of the water column above it (up to a maximum of 10 m) and thus calculates the total water depth. The electrical conductivity of water is measured using sensor with 4 electrodes which allow measurement in the range 0 – 120 mS/cm.</p> <p>Examples of use: measurement of pressure, temperature and electrical conductivity, monitoring of pollution, management of coastal aquifers: monitoring of salt water intrusion, monitoring of estuaries, monitoring of water quality and tide levels.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Dimensions: Ø22 mm, length 135 mm</li> <li>• Conductivity measurement: 0 – 120 mS/cm</li> <li>• Conductivity accuracy: <math>\pm 1\%</math> when reading at minimum 1 mS/cm</li> <li>• Maximum measured depth: 10 m</li> <li>• Precision: <math>\pm 0.5</math> cm H<sub>2</sub>O</li> <li>• Memory capacity: 48 000 readings</li> <li>• Battery life: 8 – 10 years</li> <li>• Sampling time: 1 s – 99 h</li> </ul>
<b>Additional information</b>	<a href="https://www.vanessen.com/products/data-loggers/ctd-diver/">https://www.vanessen.com/products/data-loggers/ctd-diver/</a>
<b>Funding</b>	Project „Research Infrastructure for Campus-based Laboratories at the University of Rijeka“ (RISK)
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: iruzic@gradri.uniri.hr



<b>Equipment</b>	<b>Baro-Diver</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering
<b>Short description and examples of use</b>	<p>Submersible datalogger for long-term and continuous real time measurement of air temperature and atmospheric pressure. The sensor is built into a stainless-steel housing with a diameter of 22 mm and a length of 110 mm. It can also be used to monitor shallow water levels (up to 1 m) when submerged at a fixed level below the water surface. In this case, the sensor measures the equivalent hydrostatic pressure of the water column above it and thus calculates the total water depth. The primary use, however, is to measure variations in atmospheric pressure at the surface and is installed with Mini and CTD-Divers to compensate for any pressure changes in their readings.</p> <p>Examples of use: atmospheric pressure measurement, pressure compensation on Mini and CTD-Diver, monitoring of shallow waters, estuaries and wetlands.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Dimensions: Ø22 mm, length 110 mm</li> <li>• Maximum operating depth: 1.5 m</li> <li>• Accuracy: <math>\pm 0.5</math> cm H<sub>2</sub>O</li> <li>• Range of measured temperatures: -20 °C – 80 °C</li> <li>• Precision: <math>\pm 0.1</math> °C</li> <li>• Memory capacity: 72 000 readings</li> <li>• Battery life: 8 – 10 years</li> <li>• Sampling time: 0.5 s – 99 h</li> </ul>
<b>Additional information</b>	<a href="https://www.vanessen.com/products/data-loggers/baro-diver/">https://www.vanessen.com/products/data-loggers/baro-diver/</a>
<b>Funding</b>	Project „Research Infrastructure for Campus-based Laboratories at the University of Rijeka“ (RISK)
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: iruzic@gradri.uniri.hr



<b>Equipment</b>	<b>Universal testing machine Hegewald&amp;Peschke Inspekt Table 20 kN</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Maritime Studies
<b>Short description and examples of use</b>	Universal testing machine Hegewald&Peschke Inspekt Table 20 kN, intended for testing mechanical properties of materials. Possibility of conducting tensile test with the aim of determining stress-strain diagram, yield point, maximum tensile strength, elastic modulus and deformations of specimen. Machine can be operated by hand using remote control or using software <i>Labmaster</i> capable of capturing all aspects of the testing procedure.
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Max. force: 20 kN</li> <li>• Software Labmaster for performing the tests, collecting, storing and exporting experimental data</li> <li>• Round specimens of diameter 4-10 mm or rectangular specimens of up to 100 thickness accepted</li> <li>• Clip-on extensometer MFA 25</li> <li>• Load sensor: 20 kN</li> <li>• Traverse speed: 0.0008 - 600 mm/min (at max. load)</li> </ul>
<b>Additional information</b>	<a href="https://bit.ly/2Q9YcJ6">https://bit.ly/2Q9YcJ6</a>
<b>Funding</b>	University of Rijeka, Faculty of Maritime Studies
<b>Contact</b>	Goran Vizentin, MSc, e-mail: vizentin@pfri.hr Goran Vukelić, PhD, e-mail: gvukelic@pfri.hr

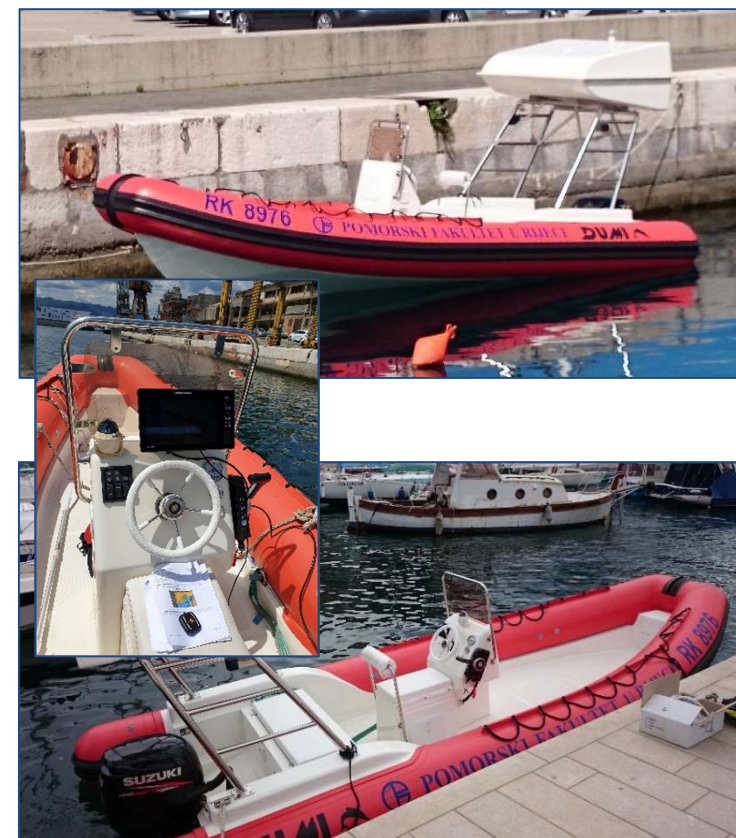


<b>Equipment</b>	<b>Non-destructive testing set of equipment</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Maritime Studies
<b>Short description and examples of use</b>	Non-destructive testing set of equipment for: visual testing, penetrant testing, ultrasound testing, leak testing. Detecting of surface and beneath-the-surface defects of the material, measurement of thickness with and without paint layer, leak testing of pipelines and pressure vessels.
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Video borescope for visual testing PeakTech 5600, flexible camera diameter 8.2 mm, view angle 60°, autofocus from 30 mm, LED illumination, TFT color display, photo and video recording</li> <li>• Penetrant set Tiede: penetrant PWL-1, developer DL-20, cleaner RL-50</li> <li>• Ultrasonic thickness gauge Sonatest T-Gage VDLW, transducer DK718EE 7,5 MHz for steels with a thickness of 1-38 mm, A/B scan, Echo-to-Echo function, datalogger, thickness measurement with and without paint layer</li> <li>• Hand pressure testing pump Rems Push for testing pressure and leakage in pipelines and pressure vessels, pressure up to 60 bar, fluid temperature up to 60°C, fluid viscosity up to 1.5 mPa · s, pressure gauge 0-60 bar cl. 1,0</li> </ul>
<b>Additional information</b>	<a href="https://bit.ly/2QlgjLX">https://bit.ly/2QlgjLX</a> <a href="https://bit.ly/2P4mJOZ">https://bit.ly/2P4mJOZ</a> <a href="https://bit.ly/2QISBJi">https://bit.ly/2QISBJi</a>
<b>Funding</b>	UNIRI projects: "Numerical modelling of crack occurrence and propagation", "Failure analysis of materials in marine environment"
<b>Contact</b>	Goran Vizentin, MSc, e-mail: <a href="mailto:vizentin@pfri.hr">vizentin@pfri.hr</a> Goran Vukelić, PhD, e-mail: <a href="mailto:gvukelic@pfri.hr">gvukelic@pfri.hr</a>





<b>Equipment</b>	<b>Boat DumI MH 650</b>
<b>Affiliation</b>	University of Rijeka, Faculty of Maritime Studies
<b>Short description and examples of use</b>	<p>Dumi MH 650 is a fast rescue boat built and equipped with all gear for the implementation of <i>Proficiency in Fast Rescue Boats Operation</i> training program according to STCW Convention.</p> <p>The boat is equipped with an outboard engine Suzuki 90 hp and reaches a speed of 25 knots. Apart from the training for professional seafarers, the boat used for different practical purposes – conducting research or transporting people and research equipment to the desired location. The boat's console is adapted to use side scan sonar Humminbird Solix 12. The boat is practical for mounting various research equipment.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Length overall: 6.50 m</li> <li>• Width: 2.50 m</li> <li>• Height: 1.96 m</li> <li>• Engine: outboard Suzuki DF90 ATL 66 kW (90 hp)</li> <li>• Speed: 25 kn</li> <li>• Construction material: GRP and Hypalon</li> <li>• Maximum number of passengers: 6</li> </ul>
<b>Additional information</b>	N/A
<b>Funding</b>	University of Rijeka, Faculty of Maritime Studies
<b>Contact</b>	<p>Lovro Maglić, Ph.D, e-mail: maglic@pfri.hr</p> <p>Vlado Frančić, Ph.D, e-mail: francic@pfri.hr</p>



## Equipment

**Boat Whaly 435**

<b>Affiliation</b>	University of Rijeka, Faculty of Civil Engineering
<b>Short description and examples of use</b>	<p>Whaly 435 is a boat made of a high-quality and resistant plastic material - polyethylene. Thanks to the durable material, this boat is very robust requiring simple maintenance. Considering high wear resistance and given length over all, it is open, spacious and very practical for transporting a variety of equipment on short distances. The boat is also practical for mounting various measuring equipment on both sides which have reinforced rubber elements.</p> <p>The boat is equipped with an outboard engine Suzuki DF30AL of 30 hp (the maximum allowable engine power for the boat). This is a four-stroke engine with 3 cylinders, 490 cm<sup>3</sup> of volume, weighing only 62 kg.</p> <p>The boat is used for different practical purposes – conducting research or transporting people / divers and research equipment to the desired location.</p>
<b>Technical specifications</b>	<ul style="list-style-type: none"> <li>• Length overall: 4.35 m</li> <li>• Width: 1.73 m</li> <li>• Draft: 0.52 m</li> <li>• Mass without engine: 186 kg</li> <li>• Maximum load capacity: 690 kg with engine</li> <li>• Engine: outboard Suzuki DF30AL 30 hp</li> <li>• Maximum engine power: 30 KS</li> </ul>
<b>Additional information</b>	<p>Boat: <a href="https://www.whaly.com/en/whaly_4351.html">https://www.whaly.com/en/whaly_4351.html</a></p> <p>Engine: <a href="http://www.suzukikuwait.com/marine/df30al/detail">http://www.suzukikuwait.com/marine/df30al/detail</a></p>
<b>Funding</b>	Project „Research Infrastructure for Campus-based Laboratories at the University of Rijeka“ (RISK)
<b>Contact</b>	Igor Ružić, Ph.D, e-mail: <a href="mailto:iruzic@gradri.uniri.hr">iruzic@gradri.uniri.hr</a>





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