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| **Infrastructure name** | AUV ABYSS |
| **Code** | AUV ABYSS |
| **Owner/Institution** | Geomar |
| **Manager** | Prof. Dr. Colin Devey (cdevey@geomar.de) and Dr. Klas Lackschewitz (klackschewitz@geomar.de) |
| **Equipment type** | Autonomous Underwater Vehicle (6000m depth rated) |
| **System description** | REMUS 6000m type AUV with LARS |
| **WEB LINK** | http://www.geomar.de/institut/einrichtungen/technik-und-logistikzentrum/auv-abyss/uebersicht/ |
| **WEB LINK TECH SPECS** | http://www.geomar.de/institut/einrichtungen/technik-und-logistikzentrum/auv-abyss/uebersicht/ |
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| **LEXI Data Base link** | |
| **Vessels normally used** | Poseidon, Meteor, Sonne |
| **Ship requirements** | The operation container should be positioned on the upper deck so that the AUV can be moved to the LARS on aluminum rails. The launching and recovery frame (LARS) is installed on adapter plates sideways or aft on the ships deck. The LARS consists of a hydraulically operated A-frame, a turntable and rails, where the AUV can be moved in the right position. As described above, the combination LARS and Operation container must be positioned in the right way. The oil pressure for the hydraulic cylinders is provided by the HPU. The hydraulic unit must be placed in the context of LARS. It is like the LARS mounted on an adapter plate on the upper deck. A number of hydraulic hoses run between HPU and LARS. The transducer must be installed on the exterior of the ship, such as a moon pool. An alternative is an outboard pole with the transducer installed on the lower end. |
| Launching method | LARS |
| **Technical requirements** | |
| Weight | 880kg |
| Buoyancy (water) | 5kg |
| Dimensions | Length@ 4m; diameter@ 0.66m |
| **Battery** | |
| Technology | 2 Lithium-Ion battery packs; 2 x 672 single cells in a pressure-tight titanium bottle |
| Charging time | |

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| Battery autonomy (e.g. X hrs @ X knots) | |
| Battery capacity | 2 x 5.6 kWh |
| **Dives** | |
| Misson depth | 10-6000m |
| Duration | Up to 22h |
| Speed | 2.5-4 kn (5 ms-1) |
| Max. range | 120km |
| Details of Autonomy/settings in emergency mode (if available) | 1. In case of insufficient battery capacity an emergency system ensures surfacing of the AUV and the sending of SMS messages (status, position, etc.) via satellite. 2. An emergency-weight can be dropped if the AUV has to surface quickly or it requires more buoyance. 3. Safety depths can be defined to avoid hitting the ground. 4. There are different algorithms in the vehicle code to ensure that the AUV can adequately respond to emergencies (eg AUV is stuck under a rock ledge, dropping the emergency weight, etc.). 5. The AUV team is able to intervene via acoustic communication. If for example the weather is getting worse then the mission can be aborted. In the event that surfacing is not possible, it can be "parked" at a certain depth. |
| **Power** | External power supply for AUV available |
| Frequency | |
| Voltage | |
| KVA | |
| Max Amps | |
| Other power requirements | Operation container (CEE socket): - 400 VAC (alternatively 380 VAC/440 VAC) / 3 phase / 32 A |
| | HPU power supply: 400 VAC / 3 phase / 63 A |
| **Hydraulic - for LARS (?)** | |
| Pressure | |
| Flow rate | |
| **Compressed air requirements** | |
| Cooling water | |
| **Subsea positioning requirements** | |
| Compatible USBL systems | |
| **Vessel GPS Feed or other requirements** | |
| **Communication requirements** | |
| Acoustic | |
| Satellite | |
| WIFI | |
| Deck Cable | |
| **Vessel Networking requirements** | |
| **No. of System configurations possible** | |
| Configuration 1 | |
| Configuration 2 | |
| Configuration 3 | |
| Configuration 4 | |

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| **Deck Layout Drawing** | |
| Configuration 1 | |
| Configuration 2 | |
| Configuration 3 | |
| Configuration 4 | |
| **System weight/COG in each configuration** | |
| Configuration 1 | |
| Configuration 2 | |
| Configuration 3 | |
| Configuration 4 | |
| **Number of containers/Items, Footprint Area required** | |
| Configuration 1 | 2 x 20' standard containers, space for LARS system. There is a requirement to store spares boxes in the ship (alternatively, a second 20-foot containers can be placed on the upper deck). ARE THERE DIMENSIONS/FOOTPRINT INFO AVAILABLE FOR CONTAINER AND LARS POSITIONING? |
| Configuration 2 | |
| Configuration 3 | |
| Configuration 4 | |
| **Deck securing arrangements** | |
| Configuration 1 | |
| Configuration 2 | |
| Configuration 3 | |
| Configuration 4 | |
| **Deck strength/Deck loading** | |
| Configuration 1 | |
| Configuration 2 | |
| Configuration 3 | |
| Configuration 4 | |
| **Transportation requirements (total weight and number of loads)** | |
| Configuration 1 | The entire system is transported in two 20-foot containers. (Weight: 7 tons - Operation and workshop containers / 11t - LARS container). Possible third container on deck if no space to store spare boxes. |
| Configuration 2 | |
| Configuration 3 | |
| Configuration 4 | |
| V.A.T. + Customs clearance practice | |
| **Mobilisation Details** | |
| Typical Mobilisation duration | |
| Typical Mobilisation cost | |
| Typical Demobilisation duration | |
| Typical Demobilisation cost | |
| **Insurance arrangements** | |
| Own use | |
| Barter | |
| Charter | |
| Co-operation | |

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| Transporation insurance | |
| **Technicians** | |
| Number and type of technicians required to operate system in various scenarios | The AUV team consists of at least 3 people. At least 2 office workspaces are necessary for data preparation and mission planning. |
| **System payloads** | |
| Total maximum payload (kg) | |
| Existing specific payloads | The following sensors are already integrated and part of the standard configuration: Seabird SBE 49 FastCat CTD (pumped CTD for determining conductivity, temperature and water pressure); Wet Labs ECO FLNTU fluorometer and turbidity sensor; Edgetech 2200-MP 120/410 kHz sidescan sonar; SeaBat Reson 7125 multibeam 200/400 kHz |
| Additional payloads | The following sensors can be installed instead of the Multibeam echo sounder: AVT Pike camera (4 Megapixel, monochrome); Edgetech 2200-MP sub-bottom profiler 4-24 kHz |
| | The following sensors can be installed on request: eH-sensor (in cooperation with Dr. Koichi Nakamura, Japan); Rockland Scientific microRider (measures turbulence microstructures) |