

Development of Research Submersible ICTINEU 3

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ICTINEU Submarins SL

www.ictineu.net

Ictineu Submarins SL was founded in 2007 to develop and built the ICTINEU 3: a scientific manned submersible, a work class vehicle with high capabilities for work, observation and intervention, also suitable for filming and leisure. It has been designed for 1.200 meters depth, and a crew of three: one pilot and two observers (passengers). It will be certified and classified by Germanischer Lloyd.

The challenge was to achieve a very versatile and highly operational vehicle, with the aim to improve the capabilities of existing submersibles in this depth rate. Cutting-edge technology has been used in the design and construction and several innovations have been introduced. These include: innovations in stainless-steel materials and design for an unparalleled volume to weight ratio of the pressure hull; composites (CFRP) have been largely used as structural and constructive material; it will incorporate the first certified, pressure-tolerant lithium-ion-polymer battery system for high energy capacity; and it includes improvements in the design and ergonomics of work-class submersibles (better performance, safety and comfort).

The result is a small and very lightweight vehicle (less than 5300 kg) that can be easily operated from most research vessels; passengers can enter/exit from the surface of the water; it has a high power capacity (10 hours full autonomy at normal load capacity), and it is expected to be able to travel up to 20 nautical miles underwater; power and communications system has been dimensioned so they can adapt to any task and mission requirements with capability to upload any instrument or sensor from the client in an easy and quick way; propulsion and manoeuvring are based on a complete 6 controllable degrees of freedom system, with a configuration of 8 thrusters, 2,5kW each with proportional control, and internal buoyancy tanks. A wide field of view is provided by a large (1,5m diam.) acrylic dome.



Authors:

Carme Parareda. Co-founder, administrator and COO of ICTINEU Submarins SL. As a Surveying Engineer she worked in the service of the Cartographic Institute of Catalonia for 15 years, since 1992, in the field of geodesy, high accuracy positioning and GPS navigation techniques. In 2004 she re-oriented her career to ocean observation and underwater technology, co-founding in 2004 the Ictineu Institute, Catalan Submarine Research Centre where she is the Secretary, and in 2007 ICTINEU Submarins SL. At the same time she coordinated the Argo Maris Foundation activities (sea exploration and outreach). She is a board member of the Catalan Maritime Cluster. A traveller who loves adventure sports and mountaineering, after crossing Mongolia by bike, she sailed across the Atlantic twice. She co-wrote a book *l'Atlàntic a quatre mans* (The Atlantic four hands).

Pere Forès. Industrial Designer. Co-founder, administrator and director of ICTINEU Submarins SL and co-founder of the Ictineu Institute, Catalan Submarine Research Centre in 2004. He has worked as an industrial designer, model maker, modeller, and after studying naval design has worked in the construction of recreational sailing and racing vessels for 15 years. He specialized in construction materials and processes involving composites and new materials. He built his first submarine at the age of 11, and later has designed and built his own sailing boats, being the last one an open racing ship with which he has crossed the Atlantic twice. He has conceived and designed the ICTINEU 3 and its functionalities. He co-wrote the book *l'Atlàntic a quatre mans* (The Atlantic four hands).