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Low-cost instrumentation for high-resolution coastal monitoring

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Most of the physical phenomena and associated biological processes characterizing the coastal areas could be ascribed to a maximum length of 1 km and a temporal length of 1 day.
The traditional methods used for coastal surveys are limited both in terms of the spatial and temporal sampling rate and in the duration of the observation. The development of remote sensing has permitted synoptic observations on large areas, but up to now in coastal areas this approach is affected by a low spatial resolution and the lack of in situ data for sensors calibration.
A modern approach to the study of coastal phenomena requires both an appropriate spatial and temporal resolution and a synoptic observation. In order to describe the high variability of coastal dynamic processes it's necessary to develop a low-cost rapid and high-resolution data acquisition system.
This work shows the technical characteristics of a low-cost instrumentation and the potential applications.
The data acquisition, given the versatility of the electronic system is able to manage multiple channels, allowing interfacing with a wide range of sensors.
Data acquisition doesn't need a specific software, it is enough to have a pc terminal as Windows ® HyperTerminal and follow the information transmitted by the connected device. The interactive menu allows different work activities including programming and controlling.
At the moment the prototype is equipped with a chain of thermistors, the temperature measurement is carried out through a glass bulb (height 10mm and a diameter of 1.5 mm), with a sensitivity to variations in temperature of 0.1 $^{\circ}$ C.
The versatility and lowcost of this type of instrumentation allows the application into multiple operative condition, it can be used on fixed measurement stations or vessels, creating a network of measurement able to study correctly the oceanographic phenomena with the necessary space and time resolution, reducing costs.