

Torbay Weather & Tide system

Torbay estuary provides a natural refuge for shipping from South Westerly gales in the western approaches to the English Channel. The Torbay harbour authority consists of the ports of Brixham, Paignton and Torquay and is administered by the Torbay local council authority, their requirement was for a system providing both 'live' weather and tide information together with accurate records.



Plan showing layout of weather & tide systems

Ohmex have recently completed the contract to install hardware and software forming an environmental data system for the port of Torquay requirements. The equipment supplied comprised a remote weather station, a tide gauge, radio telemetry system and EDAS data logging/display software. The environmental system has been installed within the enclosed harbour which includes a separate inner and outer harbour, both of which feature extensive moorings for commercial and leisure use. The Tide Gauge was installed within the harbour but outside the inner harbour which is impounded by a 'cill' to maintain minimum water levels. The control system and data logging software was installed on the clients existing computer network system in the Harbour Authority office.

Weather Station Cluster

The remote weather station is a solid state Airmar LB100 sensor, Pacific Crest EDL2 radio and a YAGI antenna mounted on a leading light at the harbour entrance, the position mounted on the breakwater at the entrance to the harbour giving realistic wind conditions to mariners travelling outside the harbour. The cluster is powered by 12v DC derived from the existing mains electricity source within the harbour light housing. The area is open to the public and the first installation was disrupted by vandalism when a fire was lit under the wooden boardwalk which destroyed the power supply to the light.



The weather station/radio cluster

The LB100 is a fully integrated weather array featuring state of the art combination of wind, temperature, barometer, relative humidity, position and attitude sensors. The LB100 is a version without position and attitude sensors but with Ohmex modified firmware designed specifically for static land based applications such as Port VTS information systems. A lightweight unit, the instrument is of a robust, high strength construction, designed to withstand installation and use with no fear of the damage commonly experienced with the more fragile cups, vanes or propellers. Without the need for expensive on-site calibration or maintenance and with a corrosion free exterior, LB100 is a 'fit and forget' unit.

Tide Gauge

The Tide Gauge installed is an Ohmex TidaLite mounted on the inner harbour wall known as the 'Barking Kiln' (something to do with old wooden fishing vessels). The gauge was mounted within an enclosure with the sensor passing through the wall and down the face of the quay, data was passed to a Pacific Crest EDL2 radio mounted above the gauge on a harbour light. As the system is open to public access the working voltage of the installation is a safe 12vDC derived from the existing mains source. The TidaLite system uses very low power pressure transducer designs which allow long term deployment from the internal battery power supply. The transducer is supplied complete with a hermetically sealed cable and enclosure which reduce the risk of damage to the enclosed stainless steel transducer element. The temperature compensation and amplifier electronics are mounted within the transducer immediately behind the pressure diaphragm giving a stable low-noise output signal.

TidaLite includes a barometer so the standard unvented transducer can be corrected for atmospheric pressure variations. The transducer has been fitted inside a 50mm scaffold tube for safe deployment alongside active moorings. In addition to saving data internally the TidaLite will calculate and save the Significant Wave Height (as defined by Draper/Tucker analysis) together with the measured Full Wave frequency. This wave information is becoming increasingly important in the definition of inclement weather periods during dredging and coastal engineering operations.



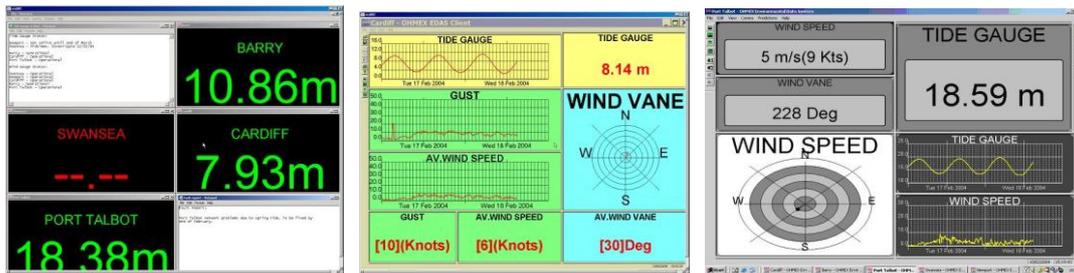
Tide Gauge mounted on harbour wall

Pacific Crest EDL2 radio telemetry

The EDL2 is an advanced, high speed, UHF wireless data telemetry link that is designed specifically for high reliability outdoor telemetry applications. General design features include a rugged weatherproof enclosure that mounts directly to a variety of different antennas for superior performance without the loss associated with long coaxial antenna leads. A unique design feature of the EDL2 is the visible external status LEDs (TX, RX and Power), these greatly assist fault finding in the field avoiding the need to derig the equipment, with the aid of a simple pair of binoculars the engineer can monitor the radio operation in-situ and observe power and transmission status from ground level. The EDL2 radio network deployed at Torbay uses the ability to work in a simple network with two radios transmitting to one receive radio using Forward Error Correction(FEC), thus avoiding data collisions when sharing the same frequency channel. The EDL2 has a very wide range of UHF radio frequency options which are easily configured with the application software provided with the equipment.

EDAS software

The concept behind EDAS software is to provide an Environmental Data collection system using distributed computer processing and saving the results in a standard database format thus making use of modern computer networking technology. The system was originally designed and installed at the port of Sheerness in 1992 running on their Amstrad 286 PC computers. The EDAS software was completely redesigned in 1998 as a client/server model, it was installed at the port of Southampton where it has been running ‘24/7’ for the past 10 years.



Typical screen shots of EDAS clients

The current software updated for Windows Vista/XP is fully operational in many ports and harbours around the UK and throughout the world. The system was the subject of an extensive article in 1999 where it won the best paper of the year award from the Hydrographic Society.

Future Proofing

The EDAS software has been designed to interface its data via TCP/IP networks to a wide variety of VTS devices, these include AIS base stations and Port Radar systems. The same network interface can be utilised to send the data to a web server so the information can be presented to the public on a client designed website. The software has been proven to be a scalable solution with the flexibility of adding weather stations and tide gauges sources from other locations as required. The ODBC database interface allows the software to store its data in a wide variety of commercial databases across the client network thus complimenting exist data storage and backup policies. The hardware sensors are precalibrated and designed to be plug replaceable rather than recalibrated when they reach the end of their working life, this strategy greatly reduces the long term maintenance costs of the system.