Bluetooth Tide Gauge

TideM8 is a combination of the Ohmex TideM8 miniature tide gauge system and Trimble's Juno hand-held Mobile PC with integrated GPS. The system is a new design based on the 'Winstrument' concept of an instrument using Bluetooth communications and Mobile PC equipment as the user interface.

Using the latest low power processor and flash memory technology, the new gauge design offers precise calendar and time-keeping functions together with solid state data retention. The internal data logging will retain up to ten years of data readings, each record containing time, date, average tide, water temperature, barometric pressure and wave range. The internal 16MByte flash memory can be erased from within the software using the password-protected software commands, all of the internal settings are retained in the flash area of the microprocessor.

In the world of dredging and hydrographic survey the tide gauge has largely been replaced by RTK GPS, giving high quality tidal Z values local to the point of measurement, however, the relative low cost and reliable logging tide gauge is nearly always deployed as a backup device and also provides a gross check on the GPS values. For Port and Harbour operations reliability and cost are the main parameters of interest, an ideal scenario would be an RTK antenna deployed on a buoy and to send real time height values back to the port control via telemetry. In reality the cost of an RTK rover unit with its associated base station and telemetry do not firmly represent value when compared with a more conventional tide gauge. The vulnerability of the rover system together with the fallibility of radio telemetry are also a potential weakness when the system is required to provide data even during storm and bad weather conditions.

The Trimble Juno ST handheld is a low-cost Mobile PC device with non-rugged GPS receiver for field data collection and mobile GIS. The Juno ST handheld is Trimble's most compact, fully-integrated field computer. If you need 2 to 5 metres accuracy in the field, you can use the integrated WAAS receiver for real-time corrections. Integrated Bluetooth and wireless LAN technology provide options for connecting to the Internet and corporate network to access data. The device is powered by Microsoft Windows Mobile version 5.0.

Stainless steel transducers are used, pre-calibrated at 1 bar they are easily exchanged without any need for further calibration other than a simple reset and the setting of offset to local tide values. The TideM8 uses conventional pressure transducer technology as the measurement technique giving a compromise solution between high accuracy and rugged reliability. A correctly installed pressure transducer is not susceptible to many of the environmental elements that cause other designs to fail such as condensing fog, freezing atmosphere or storm driven rain and waves. Many alternative technologies give adequate performance in calm weather conditions but fail to give consistently reliable duty during inclement weather or storm conditions.

The TideM8 is a modular design system with various discreet elements that can be combined together to form a specific tide gauge system, it has been designed to interface directly to external displays or computers using Bluetooth or the Ohmex Short/Long range radio telemetry modems for serial communications. The final system can be connected to a range of devices including data logging PCs or dedicated LCDs offering simple remote display of numeric data. Using Bluetooth communications the user does not have to make a physical cable connection to the gauge to download data or modify internal settings. The user comes to within a reasonable distance of the gauge (>100m) to log on, then using a hand held Pocket PC device such as the Juno to download data stored on the instrument.

The software included with the TideM8 system is designed to run on a Windows Desktop PC or a Windows Mobile PDA device. The presentation window shows a history of the previous 48 hours shown as a two day time series plot, current values are shown as numeric text values. In the event the screen data is not refreshed within a five minute period then the screen automatically blanks to avoid old static data being used as a current value, a very important feature for use in VTS navigation systems. From the software the user can download and export the previous 48 data into an ASCII datafile in CSV format for loading directly into spreadsheets. The software designed to run on the Juno enables the current position and time to be stored in the tide gauge data settings, at a later date the download will present the user with the GPS location the tide gauge was last setup and its internal clock will be set to GPS time to within a reasonable accuracy. Local settings held on the gauge include the current barometric and temperature offsets together with water density and display settings.