

The Application :

Real Time Water Level, Wave, Tide and Meteorological information for Dredgers and Survey Vessels



1. Requirements:

- A support system that delivers real-time information to vessel(s) and central station.
- Continuous data communication via radio transmission.
- Data: water level, waves (Hmax. Hs, Ts), Tides, water current, wind speed, wind direction, atmospheric pressure.
- Wave Analysis: wave spectra to identify long waves, wave energy calculation, swell
- HYPACK integration: data sent to vessels in HYPACK format
- SMS & E-Mail alarming
- Central station infrastructure for data reception, processing, analysis, viewing and storage.
- Website with data visualization.

2. Challenges:

- System integration, additional wave analysis, IT at the central station, alarming procedure, website generation, HYPACK output.
- Each part of the system needs to be reliable under maritime usage to ensure hassle free uninterrupted operation for a number of years.





3. Results:

The system components delivered:

| Ultrasound LOG_aLevel sensors Ultrasound LOG_aLevel sensors Wave Wave Water Level Tide | Solar Power System - 2 x 100Wp Solar Panels - MPT charge regulation - 2 x 110 Ah AGM Batteries | 2D Inductive Current Meter |
|---|---|---|
| VHF Radio transmitter and receiver Image: Comparison of the second sec | Ultrasonic 2D-compact Offshore Wind Sensor Wind speed Wind direction | Barometric sensor |
| Central Station | Virtual air temperature | |
| Data logger | GPS TIME | |
| Data backup for 24 months of recordings (not susceptible to any radio communication problems) | | Housing for the electronic components on the platform that provides adequate protection |
| Central Server | nal LIDE (uninterrunted neuror europh) | Eutornal NAS for data backura |
| Server PCs as well as all necessary storing the data Data verification for completely ar Wave analysis processing Alarm algorithms | software for viewing, processing and | |



The System Concept:



Hardware Setup:

The VHF communication is able to transmit data over a line of sight of 30km. On shore the data is received, stored, analysed and graphically shown on a PC.

The system is optimized for very low maintenance thanks to the remote-sensing technology, sensors with no moving parts, special corrosion protection and extended range temperature of all electronic components. These parts require minimal maintenance, thus significantly reducing operation costs. All sensors are calibration-free, making the system easy to install and maintain but also ensuring that maximum accuracy is always guaranteed.





Software Setup:

At the central station the LOG_aLevel software is used to display all data and export data for central storage. The software runs on a Virtual Server. The system further allows easy report generation. Finally, a Website is generated, which allows multiple users to easily access relevant information.

The criterion for a wave energy alarming is calculated from the energy density spectrum.

When the currently calculated values exceed a certain threshold value, then an alarm is triggered and an SMS and an Email is sent to multiple recipients.

To enable the system to send SMS, a GSM-Modem with a valid SIM card was connected to the to the central computer at the central station. For enabling the system to send messages via Email an SMTP server was made available.



NOTE: The data transmission can be also realised as an AIS AtoN system to make data available to a larger range of vessels with AIS AtoN receivers:

09:30 10:00 10:30 11:00 11:30 12:00 12:30 13:00 13:30

1005.47

0.1

09:30

10:00

10:30 11:00

12:00 12:30

11:30

13:00 13:30

Data includes position, status, meteorological and hydrological data

0.28

- Any number of vessels can be setup to receive the signal
- Typical range is 15-20 nautical miles