

LOG_aLevel

Tsunami Warning System

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A modern Tsunami Warning System consists of multiple coastal & near-shore stations and meteorological buoys in open sea. All information is centrally collected, analysed and warnings are communicated to all relevant authorities.

The LOG_aLevel system can be used to predict tsunamis and give warnings between a few minutes (10-15 minutes) to hours before the first wave reaches the shore (this time estimate depends on the earthquake's epicentre).

- Local Tsunami warning centers use:
 - earthquake information
 - tide gauges
 - buoys & other offshore monitoring systems
- LOG_aLevel:
 - Extract tide info
 - Analyze wave parameters
 - Identify long period waves

The LOG_aLevel system is used as Tsunami Warning System in 2 configurations:

- As a stand alone local warning system based on a coastal (or near shore) installation
 - The local system can provide reliable warnings at least 15 minutes before the waves hit the shore (this depends also on the epicenter of the earthquake)
- As part of a global warning system solution together with deep sea stations
 - The global system can provide reliable warnings even hours before the waves hit the shore (this depends also on the epicenter of the earthquake and the distance of the deep sea monitoring stations from the shore)

The LOG_aLevel system as stand alone local solution performs:

- Water level monitoring and Tide & Wave Analysis (based on Ultrasound & Radar technologies)
- Additional Hydrological and Meteorological Monitoring (Wind sensor, Barometric pressure, 2D Inductive current meter)
- Monitoring of Geological Data (accelerometers or direct data from Geological Authorities)
- Event Alerting System (SMS, Email, Radio to Vessel, AIS AtoN, Satellite transmission)

Existing LOG_aLevel Stations can be easily extended and configured as stand alone Tsunami Warning System

The absolute essentials of such a system include a GPS timer, barometer, anemometer and data transmission system & software which will make the necessary analysis in real time and issue the warning signal by SMS and / or Email.

The next step would be to install a sensor for measuring earthquakes or better yet a communication system with the local Geophysical Observatory. The geological Information is then used for verification (to rule out false alarms). Also recommended to install flow / current sensor.

The LOG_aLevel system as part of a global solution performs:

- Water level monitoring and Tide & Wave Analysis (based on Ultrasound & Radar technologies)
- Additional Hydrological and Meteorological Monitoring (Wind Sensor, Barometric pressure, 2D Inductive current meter)
- Monitoring of Geological Data (accelerometers or direct data from Geological Authorities)
- Event Alerting System (SMS, Email, Radio to Vessel, AIS AtoN)

- Maintenance-free & calibration-free
- Robust and Reliable under Extreme Conditions
- World-wide used and proven technology
- Accurate
- Remote sensing

Sensors with large measurement distances are preferred, to increase system robustness



- Measuring range: up to 30m
- Field accuracy: 1-2 cm
- Resolution: 1 mm
- Sample rate: up to 5 Hz (user selectable)
- Averaging (HW) : none/10s/30s/1m/5m/10m
(SW) : none/1s/2s/5s/10s/20s/30s//1m/2m/5m/10m
- Time accuracy: 1 ms GPS synchronised RTC
- Telemetry output: RS 232 (RS485, LAN optional)
- Frequency: 30...80 kHz depending on measurement range
- Power supply: 12VDC / 110-240VAC
- Working temp: -20 °C up to +70 °C
- Storage temp: -40 °C up to +80 °C
- HYPACK integration



Integration with all necessary sensors & communication systems...

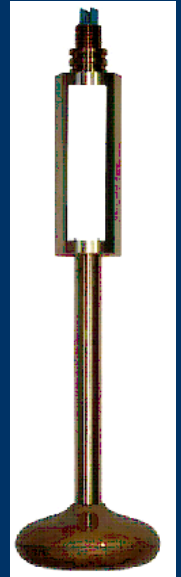
Data Logger CF or SD



Barometric Pressure



2D Inductive Current Meter



AIS AtoN



Multi-parameter weather station with the 6 most essential weather data



GSM/GPRS and Radio Modules



GPS Time Module

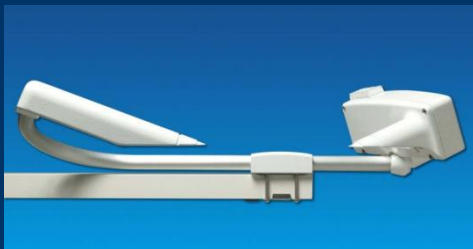


2D Ultrasonic Anemometer

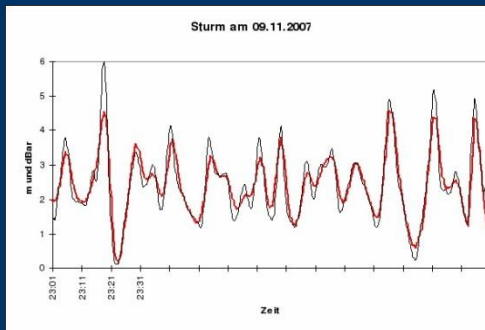


To further enhance reliability, we recommend redundant sensors and communications!

- Cost effective local tsunami alerting
- Large distance measurement (up to 50 meters)



Example of Near Shore stand alone system with solar and wind power



LOG_aLevel

Calibration and maintenance free

Robust, precise, economical

Modular system to fulfil different customer requirements and easy upgrade and maintenance due to simple exchange of modules

Reliable even under extreme conditions

Low installation effort

Completely autonomous operation possible

Worldwide approved, tested and used

Easy to use Windows-Software for data logging and control