

SEA LEVEL – ETIDE-I

REFERENCE TIDE STATION AND TIDE AND TSUNAMI COASTAL STATION

SYSTEM OVERVIEW

TIDE STATION, COASTAL TSUNAMI DETECTION AND WARNING

The Envirtech eTide-I station performs, records and transmits accurate water level measurements on a regular and uninterrupted basis over long periods of time while maintaining a stable elevation reference. The technology, one of the most reliable and modern available on the market, in conjunction with bidirectional satellite or radio transmissions, consents to implement Tsunami monitoring stations to be deployed along coasts in addition to deep sea tsunami buoys. eTide stations are available in two basic configurations, one with a microwave gauge hosted inside a stilling well, and the second using a radar altimeter, measuring the air gap, to be mounted enough high on the coast to survive tsunami waves. Further sensors can complete each station.

WHAT IS A REFERENCE TIDE STATION

It is a tide station for which independent daily predictions are given in the tide tables and from which corresponding tide predictions are obtained for subordinate stations by means of differences and ratios.

WHAT IS THE GLOBAL SEA LEVEL OBSERVING SYSTEM: GLOSS

GLOSS is an international programme conducted under the auspices of the JCOMM of the WMO. The main component of GLOSS is the 'Global Core Network' (GCN) of 289 sea level stations around the world for long term climate change and oceanographic sea level monitoring..

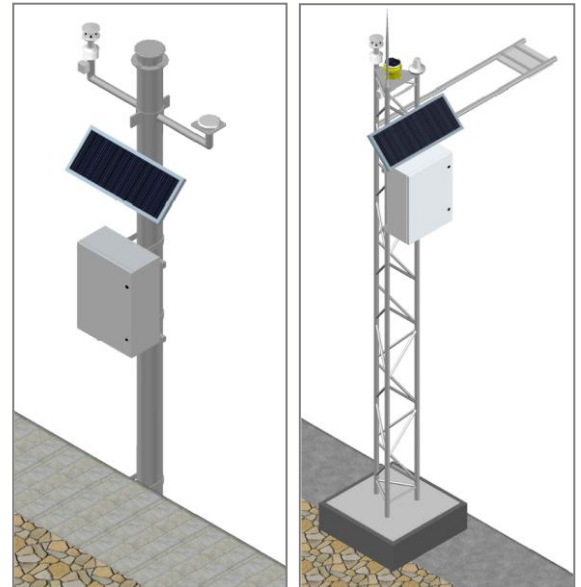
WHAT IS A TSUNAMI CAPABLE TIDE STATION: TCTS

The TCTS Primary application is to increase Tsunami detection capabilities in *Tsunami Warning Systems*. Basically they are coastal tide stations that must survive Tsunamis and are able to transmit high rate (1 minute) and high accuracy data in real time.

ENVIRTECH TIDE STATION - TECHNICAL DESCRIPTION

Main features are:

- WMO compliant
- Unmanned operation
- Model M - Real time, microwaves gauge, with stilling well (Tide reference station)
- Model T - For coastal tsunami measurement, real time, radar gauge (Air Gap), without stilling well. Sample rate 120 samples/min. Average data: 1 sample/min - Tsunami Event driven transmission. The radar head can be mounted up to 85 meters above the sea level, to obtain a resilient, high reliability, solar powered tsunami-surviving system. Optional software to evaluate significant-height and period.
- High accuracy and reliability in any condition, very high MTBF, very low maintenance.
- Satellite or Radio bidirectional transmissions
- Autonomous power supply system based on solar panels and/or a primary lithium battery pack.
- Options Meteorological sensors, multiparameter probe and other custom.
- Options – accurate, mechanical level gauge with local printer or other technologies on request.
- Output data in any customizable format, CREX, GOOS, CVS, SQL Database etc.
- Tsunami detection algorithm for automatic change of transmission frequency.
- Autonomous power supply system based on solar panels, eolic generator and/or primary lithium battery pack.



Model M: Tide Station with microwaves gauge and stilling well.

Model T: Tide Station designed to resist tsunami waves, it uses a Radar altimeter and can be mounted up to 85 meters above the sea level.

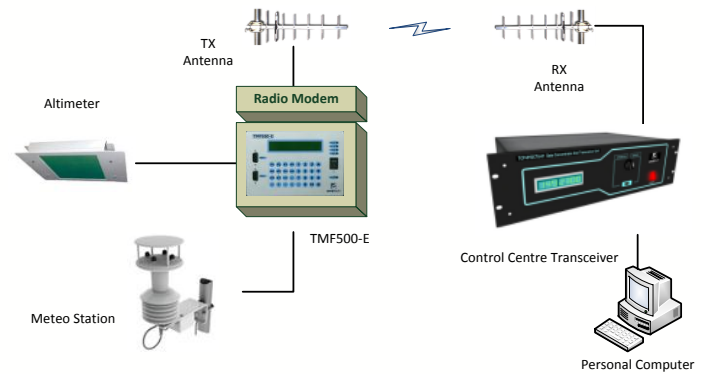
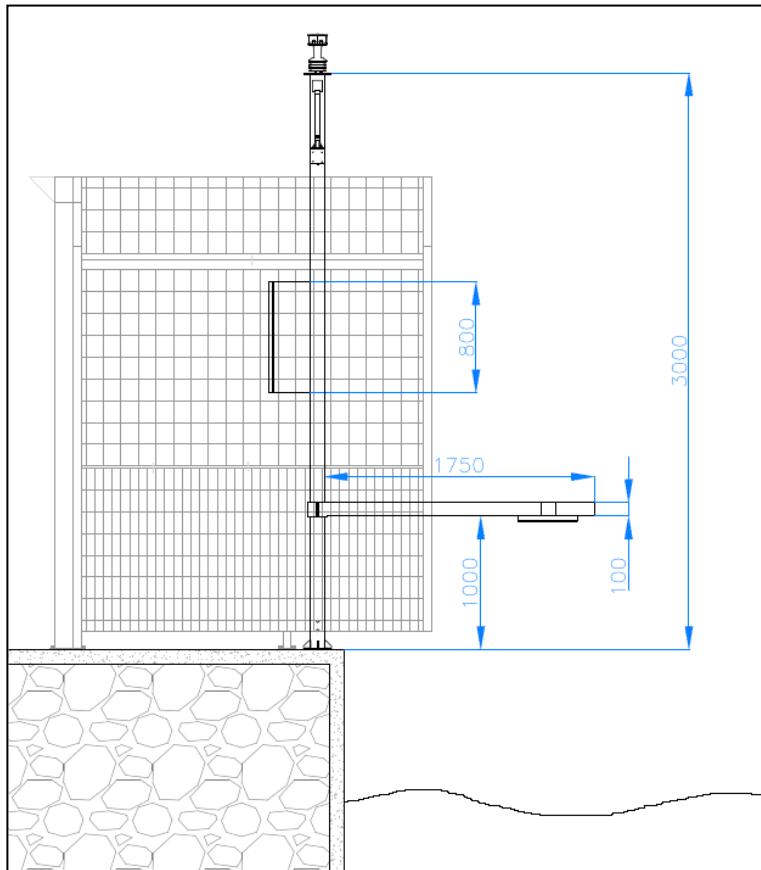


The eTide-I/T in Venice Laguna, Malamocco South Gate (Italy), powered by solar panel and eolic generator.



Envirtech is a private Italian company that is completely owned by its management. It invests more than 30% of its annual revenue in research. Envirtech manufactures according to strict standards of quality control and is ISO9001- 2000 certified.

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GENERAL INFORMATION

	Model-M	Model-T
Tide Gauge	Microwaves antenna	RADAR ALTIMETER Patch Antenna
Construction	Case in AISI316, coupled by flange to tubes from 100 mm to 400 mm	Aluminum AL57S
Measuring Range	0.5 .. 35 meter	1 .. 10 meter up to 3 .. 85 meter
Operational temperature range	-40 .. +80 °C	-30 .. + 50 °C
Protection	IP68 – 1 Bar	IP68 – 1 Bar
Modulation	Short pulse	Triangular FM
Accuracy (Averaged measurements)	< +/- 2 mm	< 1 mm
Sampling Rate	1 sample/s	2 .. 50 sample/s
Significant height and period calculation	Not available	Yes
Tsunami detection algorithm	On request Envirtech proprietary	Envirtech proprietary
Remotely configurable and operable	Yes	Yes
Transmission Rate to Control Centre	1 .. 60 min configurable, depending on transceiver capabilities	1 .. 60 min Configurable, depending on transceiver capabilities
Datalogger Storage	Up to 5 years locally stored data	Up to 5 years locally stored data
Local Display/Keyboard	Yes	Yes
Local User Interface	Ethernet	Ethernet
Transceivers	Inmarsat mini-C, Inmarsat D+, Iridium, GOES, VHF, UHF, GPRS/EDGE, others on demand	Inmarsat mini-C, Inmarsat D+, Iridium, GOES, VHF, UHF, GPRS/EDGE, others on demand
Scheduled Maintenance	Antifouling maintenance yearly	No scheduled maintenance
OPTIONS: Meteorological sensors, multiparameter probes, ADCP, others on request. To increase reliability, in reference stations, it is possible to install 2 or 3 gauges, and related dataloggers and transceivers (redundancy).		

Specifications can change without notice