

## Asset and System Protection

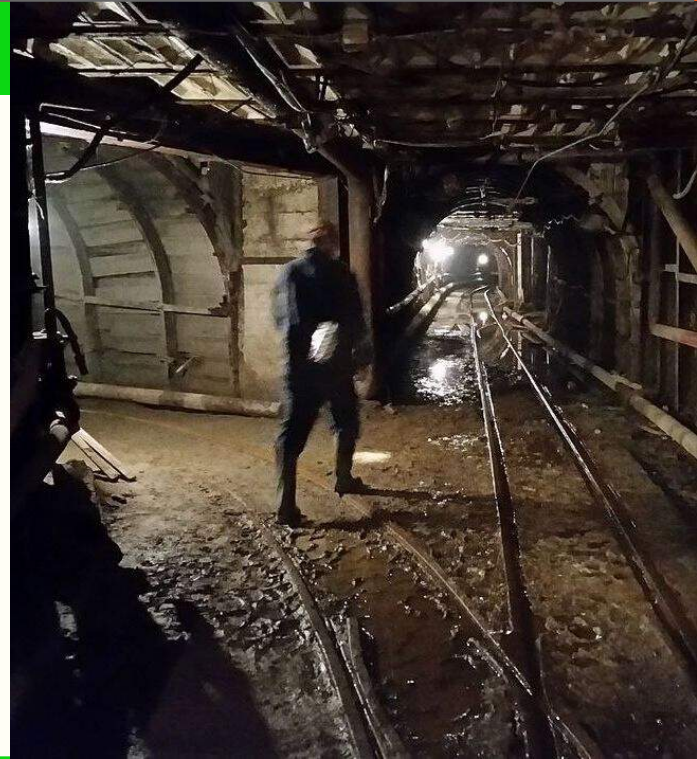
- **PREVENT DAMAGE AND MITIGATE RISK BY PROVIDING WARNING AND SHUTTING DOWN VITAL SYSTEMS BEFORE AN EARTHQUAKE STRIKES TRIAGE DAMAGE AFTER EVENT**

### Overview

The cost effective **Palert** seismic sensors can be used in critical industrial environments integrated with existing control systems to prevent equipment or facilities damage caused by an earthquake.

This is achieved by partial or full shut down of critical equipment before the earthquake shock waves arrive. The **Palert+** seismic sensor can be connected to any system such as SCADA to automate emergency procedures.

The same system can be used in a network to activate alarms and evacuate personnel before the earthquake arrival, prompting them to vacate a high-risk area plus unlocking exit doors, switching emergency lights, etc.



### Key Features

- Warning before/during/after Earthquake shock waves arrive
- Automated shut-down of vital devices (pre-earthquake)
- Activate emergency operation sequence for industrial processes
- Easily scalable to enhance data collection and functionality
- Easy to integrate with industrial applications using PLC, HMI and SCADA
- Most cost effective solution available in the market

### Applications

- Water mains Pumping/Distribution stations
- Petrochemical Refineries
- Hazardous substances management in industrial environments
- Mining Operations
- Waste Control
- Tilt Bridges, Tunnels
- Land based Oil Exploration operations
- Geothermal Plants, Wind farms, Hydro Electric Plants
- Hospitals
- Ski fields, Museums, Theatres.
- Subways, Trains, Trams



# Specifications

## Accelerometer

Tri-axial MEMS (Accelerometer) 18 bit, Analogue output

- Range:  $\pm 2$  g
- Dynamic Range: 100dB
- Accuracy:  $\pm 2\%$  (0.8 to 20 Hz)
- Resolution: 0.015 gal
- Velocity Sensor Type: Geophone Analogue output - *optional*
  - Full scale:  $\pm 100$  mm/s
  - Resolution: 0.00016 mm/s
  - Frequency range: 4.5 to 315 Hz
  - 0.1 to 315 Hz (compensated)
  - Dynamic range:  $> 130$  dB
  - Case to Coil Motion P-P: 4 mm
  - Moving Mass:  $11.0 \pm 0.1$  gram
  - Sensitivity:  $> 25$  Vm/s
  - Spurious Frequencies:  $> 240$  Hz
- AD Resolution: 4 Channel, 24-bit data
- Sampling rate: 50 sps, 100 sps, 200 sps (optional)

## System

- CPU: ARM1176JZF-S 700MHZ
- Data Storage Type: 8GB MicroSD
- Ethernet Controller: 10/100 Base-TX - MODBUS/TCP
- LCD display: 2-line x 20 character
- Watchdog Timer: 10 seconds
- RTC Accuracy:  $\pm 60$  seconds/year, adjustable by NTP
- Calibrated by International Test Lab

## Environmental

- Operation Temperature:  $-10^{\circ}\text{C} \sim +60^{\circ}\text{C}$
- Operation Relative Humidity: 10 ~ 98% RH
- Dimension(mm): 205 x 160 x 80 Nominal
- Weight: 2.1KG
- Supply Voltage: 9~30 VDC
- System Power Consumption: 3 W
- Internal battery
- Waterproof Rating: IP67
- Built-in web user interface, simple and convenient settings.
- AUX Port for Relay control (3 levels) and output audio
- Providing earthquake early warning audio output (Optional)
- Seismic event data recording function.
- Built-in standby power, with safe shutdown protection.
- Set-point Range: 1~1960 gal
- Contact Type: Normal Open
- Contact Capacity: 60V / 0.6A DC
- Hold-On Time: User defined

## Earthquake Gauge

- Algorithm: Pd, PGA, Displacement, STA/LTA
- STA Setting Range: 0.1~100 seconds
- LTA Setting Range: 0.1~200 seconds
- Event Duration Time: 1~200 seconds
- Waterproof Rating: IP67



## Palert

### Background

**Palert+** is one of a family of advanced earthquake P-wave alarm detector systems developed by San Lien in Taiwan and represented by Jenlogix in Oceania.

**Palert+** is a P-wave sensor equipped with MEMS accelerometers for 18 bit output resolution. When integrated into a network using SCADA or the dedicated controller, the **Palert+** provides the ability to trigger digital outputs enabling warnings and other actions to occur before or during an earthquake.

With Modbus TCP/RTU capabilities, it is very easy to integrate **Palert+** with industrial applications, such as PLC, HMI and SCADA. The **Palert+** can stream to 2 hosts and connect to 5 Modbus clients at the same time.

See [www.earthquakeearlywarning.systems](http://www.earthquakeearlywarning.systems) for more information.

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