

- WANT WARNING OF AN EARTHQUAKE?**
- WANT TO GIVE WARNING TO YOUR STAFF OF IMMINENT SHAKES?**
- WANT TO SHUT DOWN AND PROTECT YOUR SYSTEMS AUTOMATICALLY?**
- WANT DETAILED INFORMATION OF EFFECT OF AN EARTHQUAKE ON YOUR STRUCTURES?**
- WANT BEST OF BOTH WORLDS - MEMS AND GEOPHONE IN 1 SYSTEM?**
- WANT ALL THIS AT AN ECONOMIC PRICE?**

THE ANSWER IS

Palert +

A new member of the cost effective world renowned Palert family.

- **Low Cost**
- **Highly Reliable**
- **Internationally proven**
- **8GB system storage**
- **MEMS and GEOPHONE modern sensors**



The Palert + from San Lien provides users with the ability to react before a major quake arrives as well as providing unparalleled detailed information, all at an affordable price.

Palert + is an advanced IP67 earthquake P-wave alarm detector system. It uses embedded Pd technology, developed by Prof. Yih-Min Wu from the National Taiwan University, that can accurately, within 3 seconds, determine the size of the shockwave based on the detected P-wave. Can be used as part of earthquake early warning system. Worldwide examples - India, Vietnam, China, Philippines, Greece, Korea, Mexico, USA and New Zealand.

With both MEMS and Geophone sensors the Palert + provides exceptional detection giving warning as well as detailed information about the earthquake.

Palert + Technical Details

Three kinds of trigger algorithms:

1. Pd-algorithm as developed by Prof.Wu;
(used in Taiwan national early earthquake warning system)
2. PGA (Peak Ground Acceleration)—Palert offers 10 Hz, 20 Hz and 40 Hz low pass filters which are user adjustable to filter out high frequency components in signal generated by non-earthquake vibration;
3. The conventional STA/LTA trigger algorithm.

Micro Electro Mechanical Systems (MEMS)

Both vertical and horizontal boards reduce noise and overcome the effect of gravity during chip manufacturing, making the Palert unit more sensitive.

Geophone Sensor

A Geophone sensor is used to measure P wave and vertical displacement. The Geophone responds to velocity, rather than MEMS that respond to acceleration, and overcomes the inherent noise of a MEMS. The Geophone therefore enables the effect of gravity to be more accurately compensated. This technique was first used by the Japanese. The data provides detail for engineers/seismologists to examine displacement/P Wave of a structure all in the one unit.

Palert Features

- Supports NTP (Network Time Protocol) time calibration
- Embedded Web Server, for easy set-up
- 3 sets of Relay Outputs
- Real-time intensity broadcasting
- Earthquake data recording
- Built-in battery backup and shuts down safely automatically, before power outage
- Display MQTT (Message Queue Telemetry Transport) Emergency messages in real time
- LCD display warning and status

The China Intensity standards (GB/T-17742-2008) can also be shown on the Palert. Detailed earthquake information is stored on the system for later review, such as the latest earthquake trigger time, maximum intensity, maximum acceleration for each component and maximum acceleration in vector.

ISO Certification

All Palert systems are Taiwan Accreditation Foundation (TAF) lab tested and certified. The test lab conforms to the International Standards ISO/IEC 17025 (for testing and calibration laboratories). This is important to ensure all units provide accurate data. The Palert is also certified by the China Earthquake Administration.

Palert Specification

- CPU: ARM1176JZF-S 700MHz
- Data Storage Type: 8GB MicroSD
- Ethernet Controller: 10/100 Base-TX
- LCD display: 2-line x 20 character
- Watchdog Timer: 10 seconds
- RTC Accuracy: ± 30 seconds/year, adjustable by NTP
- Tri-axial **MEMS** (Accelerometer)
 - Range: ± 2 g
 - Dynamic Range: >100 dB
- Internal Velocity Sensor
 - Type: **Geophone**
 - Full scale: ± 100 mm/s
 - Frequency range: 0.1 to 315 Hz (linear response) (TBC)
 - Dynamic range: > 130 dB
 - Case to Coil Motion: 4 mmp
 - Moving Mass: 11.0 ± 0.1 gram
 - Sensitivity: > 25 Vm/s
 - Spurious Frequencies: > 240 Hz
- AD Resolution: 4-and 24-bit data
- Sampling rate: 50 sps, 100 sps, 200 sps (optional)

Operating Environment

- Operation Temperature: $-10^{\circ}\text{C} \sim +60^{\circ}\text{C}$
- Operation Relative Humidity: 10~ 98% RH
- Dimension(mm): **TBA**
- Weight: **TBA**
- Supply Voltage: 9~30 VDC
- System Power Consumption: 3.5 W
- Waterproof Rating: IP67

