

With over 16 years of experience in the field we have become an expert in instrumentation and station installations. QuakeLogic engineers will define with you the best solution and provide a quality service to ensure optimum performance of your monitoring systems.

SOLAR-POWERED SEISMIC STATIONS

A seismic station in the field called “free-field station” is a permanent installation, housing a seismic sensor a data logger (digitizer). Such stations often contain accelerometers, seismometers and/or GPS.

Figure 1. Seismic station in Thimpu, Bhutan; the station is powered by solar panels and fenced for protection (Photo source:

<https://blogs.worldbank.org/endpovertyinsouthasia/how-can-bhutan-better-prepare-earthquakes>)



Figure 2. Seismic station in Alaska; the station is powered by solar panels (Photo source:
<https://www.adn.com/alaska-news/science/2018/12/22/alaskas-newly-expanded-network-of-seismic-stations-keep-a-detailed-diary-of-the-earths-rumbles/>)

Attention should be paid to following items when installing a seismic station:



LOCATION: The primary objective is to have a sensor installation which is as insensitive to ambient noise due to humans and environment as possible, so that the sensitivity for earthquake signals is high. Therefore, the station needs to be as far away from oceans, car and human traffic as possible. It should be also away from poles and towers which can create feedback to soil due to their response to ground shaking. The feedback may contaminate the seismic signal.



HOUSING / PROTECTION: Ideally the sensor should be installed on hard rock within housing such as cabinet or shed for protection from wind, dust and temperature variations. The housing should provide enough ventilation.



POWER: The seismic station needs power. If the power from the public grid is unavailable, solar panels can be utilized. The panels are attached to a charge-controller and battery pack to assure uninterrupted power supply. If the station is powered by solar panels, it needs to be fenced to prevent vandalism/theft.



TELEMETRY: Seismic stations often use communication (telemetry) to a central monitoring facility as part of a seismic network. The communication can be achieved by landlines (DSL, fiber-optic), cell-modem or by satellite. The most commonly used seismic data transfer standard is SeedLink, but other data transfer protocols can also be used.

Solar-powered Free-field Station Installation



Figure 3. Free-field seismic station example powered by four 130W solar panels feeding four sealed lead-acid batteries through a charge controller (Photo source: USGS).