



# SEISODIN

WE MAKE STRONG MOTION ACCELEROGRAPHS

## Seismic Railway Monitoring

Earthquake Monitoring for Railways



[www.seisodin.com](http://www.seisodin.com)

# Seisodin Seismic Railway Monitoring

## Seismic Railway Monitoring

Trains are at very high risk of derailment during and following an earthquake. With high-speed trains today travelling as fast as 300km/h, the distance for emergency braking is often as long as 4-7km (2.5-4.5mi). With such long braking distance it is crucial that trains are stopped or slowed down immediately when an earthquake is detected along the route. An earthquake may deform the rails, creating a highly dangerous situation.

A Seisodin earthquake detection system for railways can help stop a train before it reaches an area with potentially deformed rails.

By installing a series of interconnected Seisodin Tilia accelerographs along a long train line, it is possible to detect an earthquake, and instantly alarm the train control center. This way the control center can pinpoint the earthquake and stop or slow down all traffic which is headed towards that point until the tracks have been inspected.



## FEATURES

- Very low cost of ownership
- Minimal maintenance (10yr calibration-free)
- Easy to use and simple to install
- Simple cabling with FIBER or CAT5E ethernet
- Supports connection to solar power
- Built-in UPS for 18650 battery
- Synchronized sampling accuracy to 40 nano-seconds thanks to PTP
- Seismic Event reports with earthquake intensity in MMI seismic scale

## OPTIONAL FEATURES

- Relay and alarm activation
- Control Panel with 10" touch display
- Cloud system for data and reports
- 4G modem



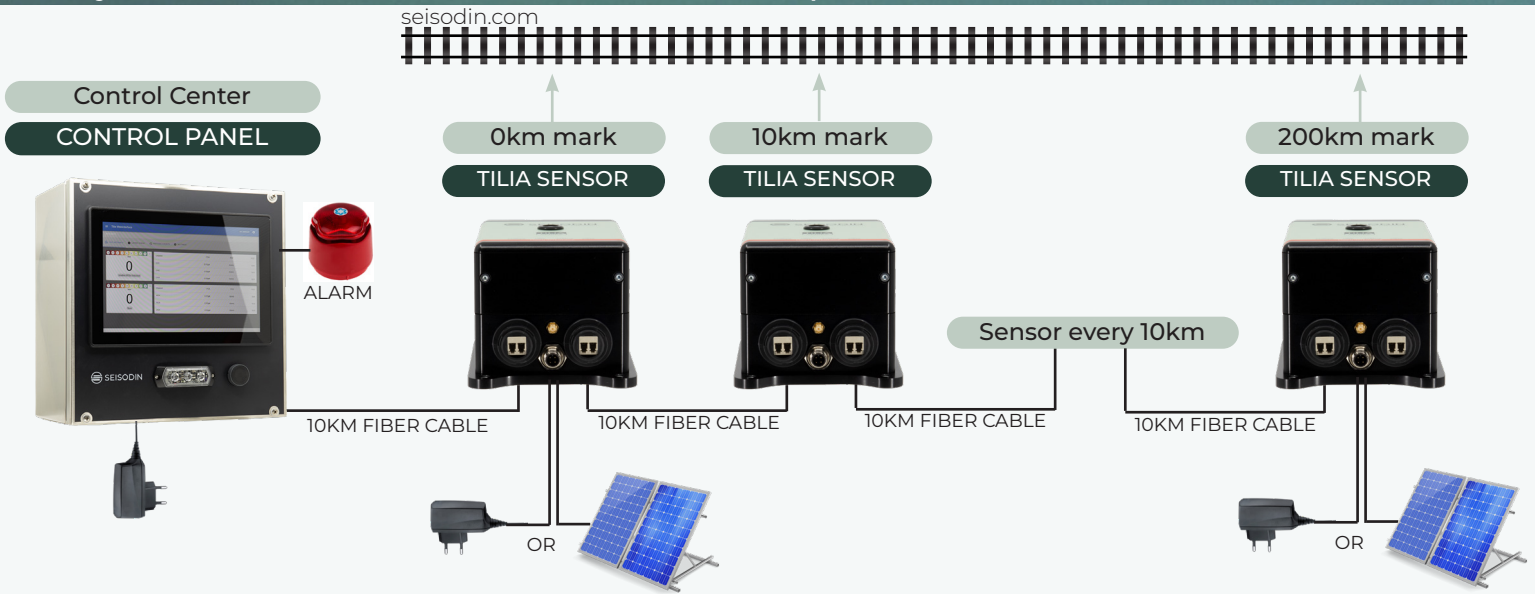
Tilia Accelerograph installed in protective field cabinet.

# Examples of Seismic Rail Solutions

**Seisodin** offers both standard and customized systems for seismic monitoring of railways. The number of sensors required, as well as the cable solution and communication interface to the control center varies between projects. For some railways, a fiber backbone is already available along the rails. For others, the fiber cables must be installed for the project. The connection diagrams below show some common installation types which may serve as a basis for a system design.

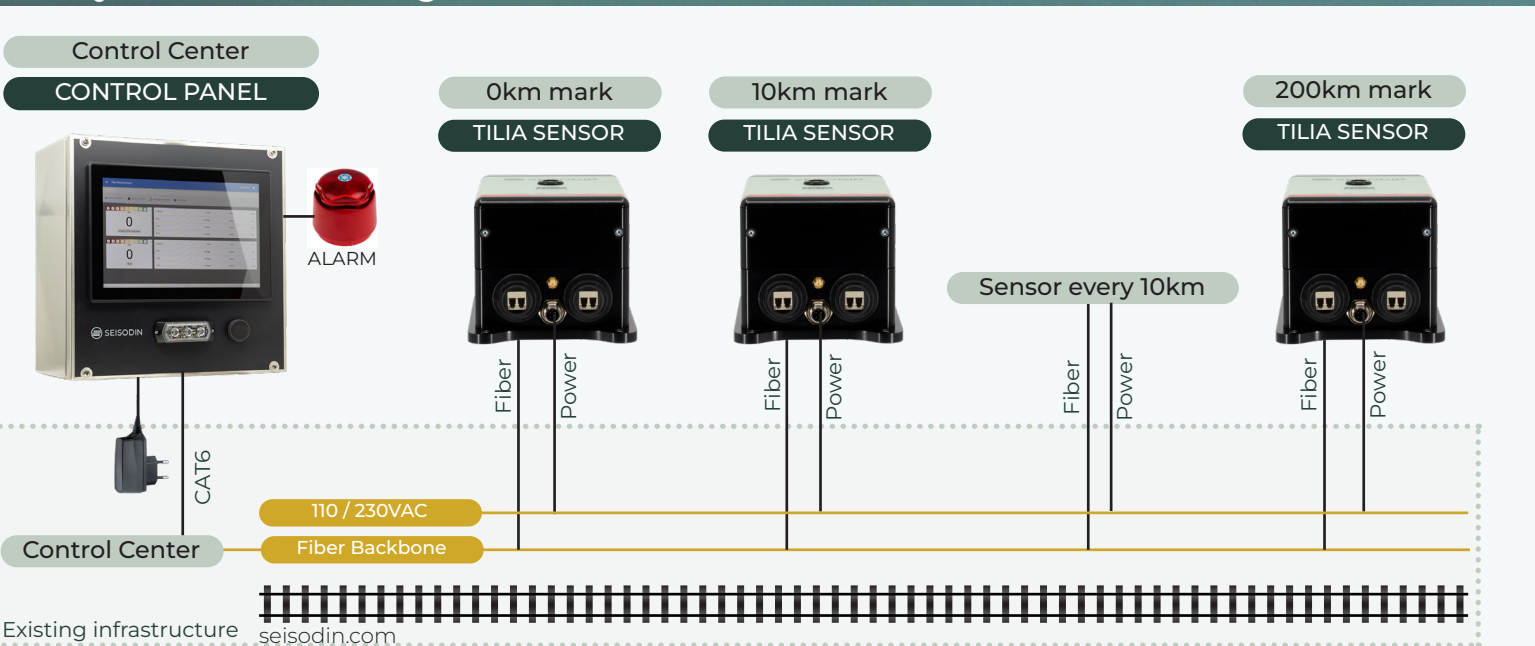
## System with custom fiber cable and solar power

## CONNECTION DIAGRAM



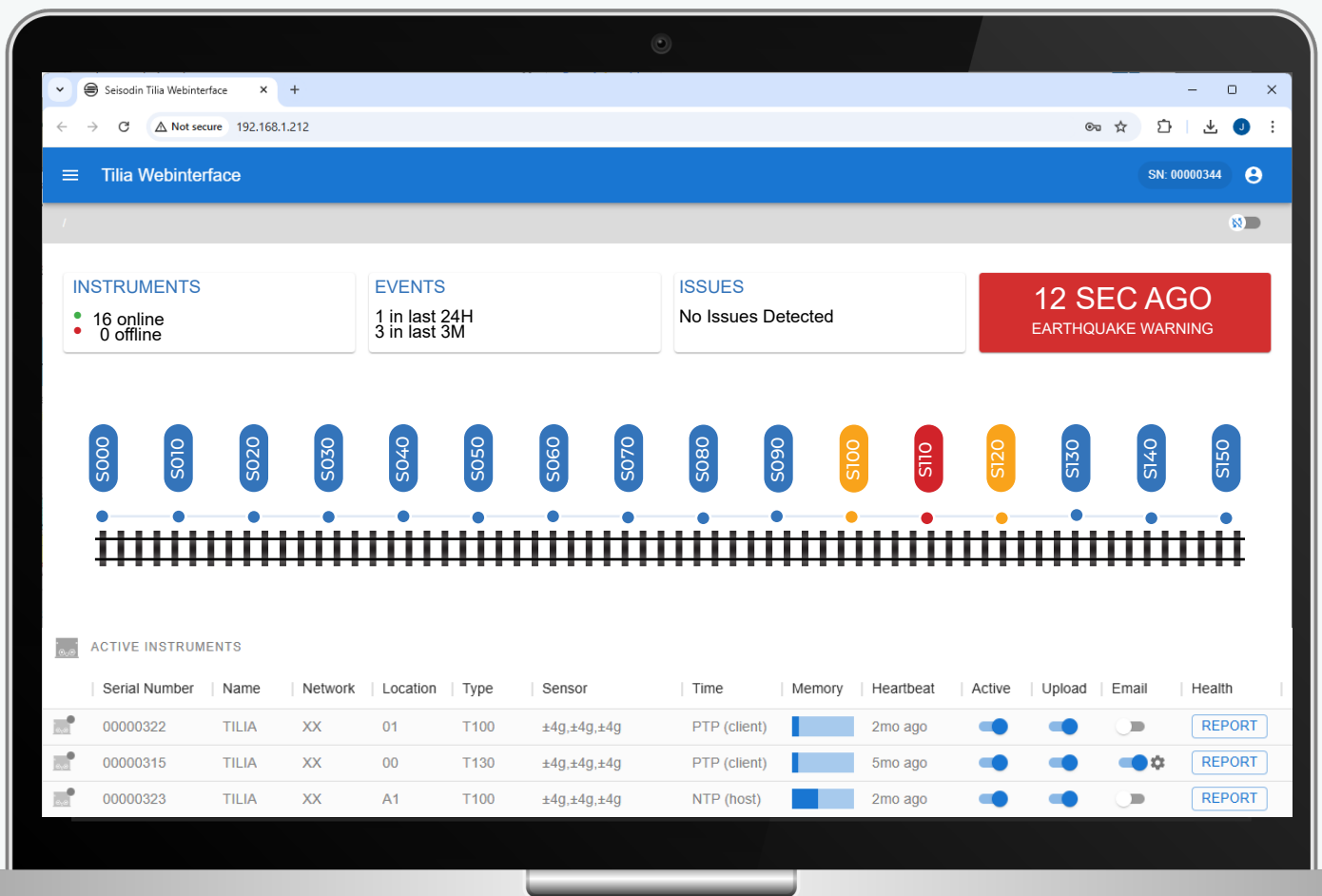
## System with existing network infrastructure

## CONNECTION DIAGRAM



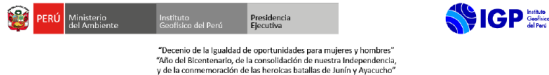
# User Interface of Seismic Rail Solution

## Live View and Instant Alarm!



# Tested, Certified and Approved

## Seismic Qualification IEC 60068-3-3 Seismic Zone 4 ACCREDITED TEST REPORT AVAILABLE



CARTA N°00025-2024-IGP/PE

Lima, 24 de Abril del 2024

Señora  
Melva Collantes Gómez  
Gerente General  
Empresa TERRASENSOR S.A.C.  
Presente

Referencia: Solicitud S/N de fecha: 05/02/2024 Expediente 02026-2024

Me es grato hacerle llegar un cordial saludo y en atención a su documento de la referencia, comunicarle que, personal de la Unidad de Ingeniería de la Subdirección de Redes Geofísicas del Instituto Geofísico del Perú, ha efectuado la evaluación de los equipos acelerométricos presentados por su despacho para revisión de las especificaciones técnicas en cumplimiento con lo dispuesto en el Reglamento Nacional de Edificaciones, Norma Técnica E.030, los cuales corresponden a los modelos: TILIA T100 y TILIA T130.

De la evaluación efectuada, el resultado indica que los 02 modelos presentados, cumplen los aspectos correspondientes a los equipos de registro acelerométrico, según lo establecido por el Instituto Geofísico del Perú - IGP, para la implementación de estaciones acelerométricas requeridas por la Norma Técnica E.030 "Diseño Sísmorresistente", según el INFORME N°0034-2024/IGP/DC-RGE, del Director de la Subdirección de Redes Geofísicas, del Instituto Geofísico del Perú.

Cabe precisar que los presentes equipos revisados al igual que otras marcas de acelerómetros triaxiales validados, cumplen con las normativas vigentes y recordar que el documento emitido por el IGP es estrictamente a modo de respuesta, por lo que no debe usarse como medio publicitario.

Agradecido por su atención, hago propicia la oportunidad para expresarle mis sinceras muestras de consideración.

Muy atentamente,

Dr. Hernando Tavera  
Presidente Ejecutivo



HTV/jb.  
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REPORT OF THE SEISMIC TESTS CARRIED OUT ON  
"TWO (2) ACCELEROGRAPHS"  
SUPPLIED BY SEISODIN



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		Laboratory Engineer	Technical Director

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**Seisodin** Tilia Accelerographs are fully seismically tested according to international standard IEC 60068-3-3 and have been qualified for use in seismic zone 4, making it suitable for use in even the most active seismic regions in the world.

Additionally, the instruments have been tested and approved by national agencies around the world.



# System Components



## Tilia T100F / Tilia T130F

State-of-the-art networked seismic strong motion accelerograph with 200Hz bandwidth and a dynamic range of up to 155dB. The instrument integrates sensors and digitizers in the same box, greatly lowering system complexity. Instruments have double ethernet interface to allow daisy chaining multiple accelerographs. Available with multi-mode or single-mode fiber transceivers for up to 20km node spacing.



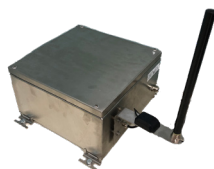
## Tilia Control Panel

Control panel for use with Tilia instruments in railway monitoring projects. The panel contains 10" industrial Touch PC with access to monitoring and alarm interface. The Tilia Control Panel includes software required for live monitoring of seismic activity along railways.



## Siren

105dB Alarm siren suitable for integration with Tilia Control Panel. The siren can be connected directly to the Tilia Control Panel, and comes in a variety of version. Version with strobe light also available.



## Field Deployment Enclosure

Stainless-steel enclosure for robust and tamper proof installation in the field. The enclosure effectively protects against dust and rain, as well as it increases protection against theft and vandalism.



## Seisodin RailQuake Software Package

Software module for Tilia instruments which enables live monitoring of seismic activity along railways.



## Fiber Optic Cable

Single or multimode cable for long-distance daisy chaining.



## Wireless Interconnection

Wireless interconnection of up to 12km between Tilia accelerographs. Requires line-of-sight.