

# Gims

GEODETIC INTEGRATED MONITORING SYSTEM

DATA  
PROCESSING



SAR  
COPERNICUS  
GNSS  
GALILEO



GIMS  
STATION  
(HARDWARE)



GIMS project aims at creating a deformation monitoring system for landslides and other hazardous movements of the ground that integrates cost-effective versions of costly technologies now used separately. Their integration allows to provide more comprehensive and more accurate results, which are an aggregation of images, movements and alarms.

To date, seven stations have been installed in the Vipava area in Slovenia, on landslides and on a viaduct affected by them, and other stations will be installed at another landslide, in a mountainous area.

## HARDWARE ON FIELD

The three technologies to integrate for the landslide monitoring are generally used separately and expensive.

### SAR

The Copernicus Sentinel satellites, in their trajectory around the globe, periodically transmit radar data that – once processed – provide images of deformations. An active SAR Reflector it easier to detect specific points to be measured.

### GNSS

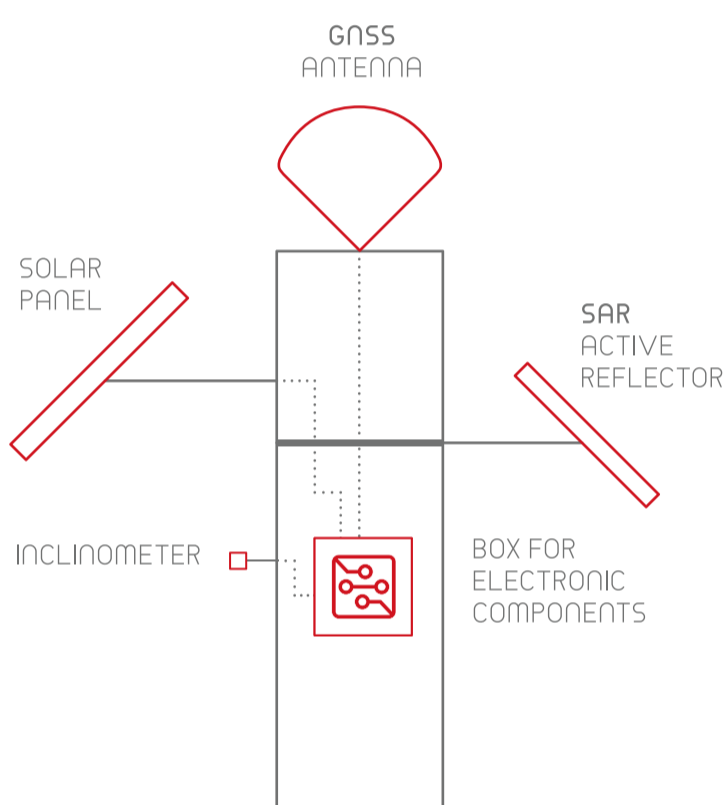
The global navigation satellite system provides continuous measurements on given points collected by GNSS satellites (including Galileo).

### Accelerometers (IMU sensors)

Inertial sensors placed inside the box are used to raise alarms in case of sudden hazardous movements.

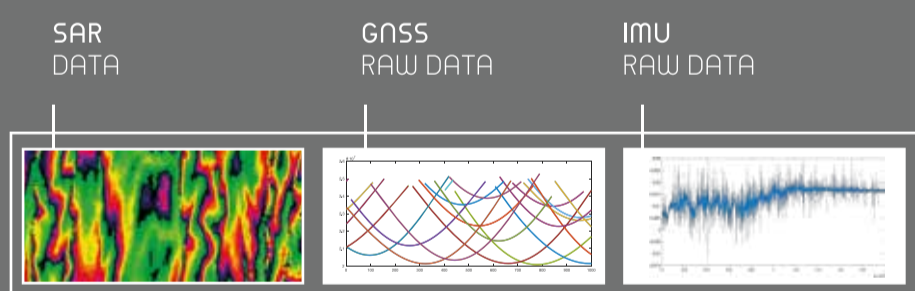
The **box** contains the electronic components: basically a miniaturized computer that controls the three measuring technologies, collects data from them and transmits data to servers. The solar panel powers the whole system.

The Copernicus Sentinel SAR data are directly downloaded from the ESA servers.



## SOFTWARE PROCESSING & HUMAN EXPERTISE

The GIMS software receives GNSS and accelerometer data from the GIMS stations through the Internet. Moreover, it receives the SAR radar data of the area covered by the stations directly from ESA Copernicus Sentinel servers. All these raw data are then processed by the technicians to obtain the deformation results and produce an integrated report for easy consultation by all interested stakeholders (public authorities, civil protection, companies, citizens).



## RELIABILITY & REPLICABILITY

The testing phase of prototype stations is in order to demonstrate that all components work properly together and produce the expected result, which is the GIMS' added value: make those technologies work in synergy.

The stations are light and fully autonomous, and can be installed on the landslide or on infrastructures located on landslides.

The real-time alarm system and the accuracy of the data produced, guarantee the mitigation of landslide-related risks and the efficient management of crisis situations.

