

# Quantities and units of measurement of the Seismic Monitoring Station

**Nowtech NT RSS902 EEWS** detects physical quantities by exploiting the operating principle of a floating retroverted pendulum mass, better referred to as Kater's pendulum.

**NT RSS902 EEWS** seismic monitoring station is equipped with 4 types of sensors used to derive:

**1. dynamic measurement expressed as differential acceleration, referred for each axis (X, Y, Z):**

- a. Adjustable scale factor with maximum full scale of 2g, 4g, 8g;
- b. Sampling frequency settable from 800Hz, 400Hz, 200Hz, 100Hz, 50Hz, 25Hz, 12.5Hz, 6.25Hz, 1.56Hz;
- c. Measurements for bipolar X, Y, Z axis
- d. Sensitivity of relief with maximum scale:
  - 2g scale, minimum detected value  $\pm 0.25\text{mg}$ ;
  - 4g scale, minimum detected value  $\pm 0.50\text{mg}$ ;
  - 8g scale, minimum detected value  $\pm 1,00\text{mg}$ .

**2. static measurement angular magnitude, referred for each axis in the horizontal plane (X, Y, Z):**

- a. Expressed in sexagesimal degrees with a scale ranging from 0 to  $\pm 89.986^\circ$ ;
- b. Sampling rate settable from 12.5Hz, 6.25Hz, 1.56Hz;
- c. Angular relief sensitivity of the order  $\pm 0.014^\circ$ .

**3. dynamic measurement of maximum peak broad-spectrum accelerometric magnitude expressed as the modulus value of the three orthogonal components:**

- a. Expressed in "g" ( $1g = 9.8166\text{m/s}^2$ );
- b. Adjustable scale factor with maximum full scale of 16g;
- c. Auto-settable sampling rate from 0.25Hz to 1KHz;
- d. Scale sensitivity, minimum detectable value  $\pm 0.06\text{mg}$ ;
- e. Single-pole output  $\text{Acc}(\text{peak-to-peak}) = \text{SQR}(X^2+Y^2+Z^2)$

**4. temperature measurement:**

- a. One internal to the detector for drift compensation, for static type measurements;
- b. An external one referring to the structure subjected to monitoring;
- c. Expressed in degrees celsius with a scale ranging from  $-55^\circ\text{C}$  to  $+125^\circ\text{C}$ ;
- d. Accuracy of  $\pm 0.5^\circ\text{C}$  over a range from  $-10^\circ\text{C}$  to  $+85^\circ\text{C}$  (93ms);
- e. Sampling rate settable from 750ms, 375ms, 187ms, 93ms;
- f. Maximum sensitivity with 750ms acquisition of the order  $\pm 0.0625^\circ\text{C}$ .