RESENSYS

SenSpot™ Wireless MID-Resolution 3D Inclination/Tilt

Ultra-Low Power Precision Sensing & Wireless Communication

Typical Applications

- Bridge health monitoring
- Monitoring of bridge bearing and expansion joints
- General structural integrity monitoring (buildings, dams, etc.)
- Automation technology
- Aerospace engineering
- Monitoring of manufacturing process
- Tunnel monitoring

Benefits

- **Long lifetime:** (battery life of 10 years)
- **Wireless communication**: No wiring is required for data collection
- **Lightweight**: 180 g (6.3 oz.)
- **Easy mounting:** Flange-mount or adhesive tape
- **Adjustable sampling interval:** From 18sec to 10min
- **Long communication range:** 1.0Km (0.62miles) free space
- **3D-Measurement:** Monitoring the tilt in three directions instead of just one direction

Specifications

- **Operating range:** ± 15^{o}
- **Resolution:** 0.01 degrees
- **Repeatability**: ≤0.01^{o}
- **Time constant:** ≤0.01sec
- **Working temperature:** -40°C to +65°C (-40°F to +150°F)
- **Dimension:** 140mm (5.5”) x 60mm (2.38”) x 32.5mm x (1.28”**)**
- **Ingress Protection:** IP67, weatherproof Protected against rain, snow, and UV exposure
- **Power source:** replaceable lithium-ion battery

Description

SenSpot™ provides an easy to install, scalable solution for distributed structural integrity monitoring. SenSpot™ inclination/tilt uses Resensys's proprietary technology for reliable and accurate measurement, large-scale sensing, wireless synchronization, and ultra-energy efficient wireless communication.

SenSpot™ is designed to operate maintenance-free for more than a decade. After installation, SenSpot™ does not need calibration, battery replacement, or any other maintenance for at least 10 years. Due to small size and lightweight, SenSpot™ sensors can be applied easily to as many critical spots on a structure as needed, with minimal installation effort.

As a part of the Resensys solution for integrity monitoring system, SenSpot™ inclination/tilt can be used to monitor the smallest movements of structural components such as piers, decks, rocker bearings on a highway bridge. In addition, SenSpot™ inclination/tilt monitors changes in these quantities as the structure expands or contracts as a result of temperature variations. In addition to bridges, SenSpot™ inclination/tilt can be used in a variety of other structures. Examples include buildings, dams, etc.

Installation and Dimensions

The tilt sensors are built-in the SenSpot™ unit. The measured value is transmitted wirelessly to Resensys data wireless logger (SeniMax™). It is recommended to install the SenSpot™ with screws and anchors through the flange. It is also possible to install the SenSpot™ with 3M VHB tape on smooth surfaces (e.g., steel or metallic surfaces).

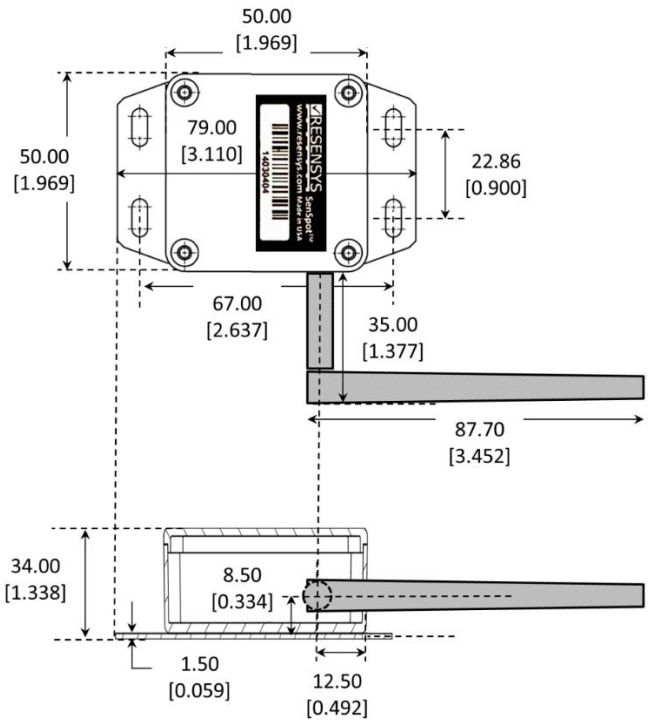

Figure 1: Tilt SenSpot™ (MRT) dimensions. All dimensions are in mm [inch].

Direction Diagram

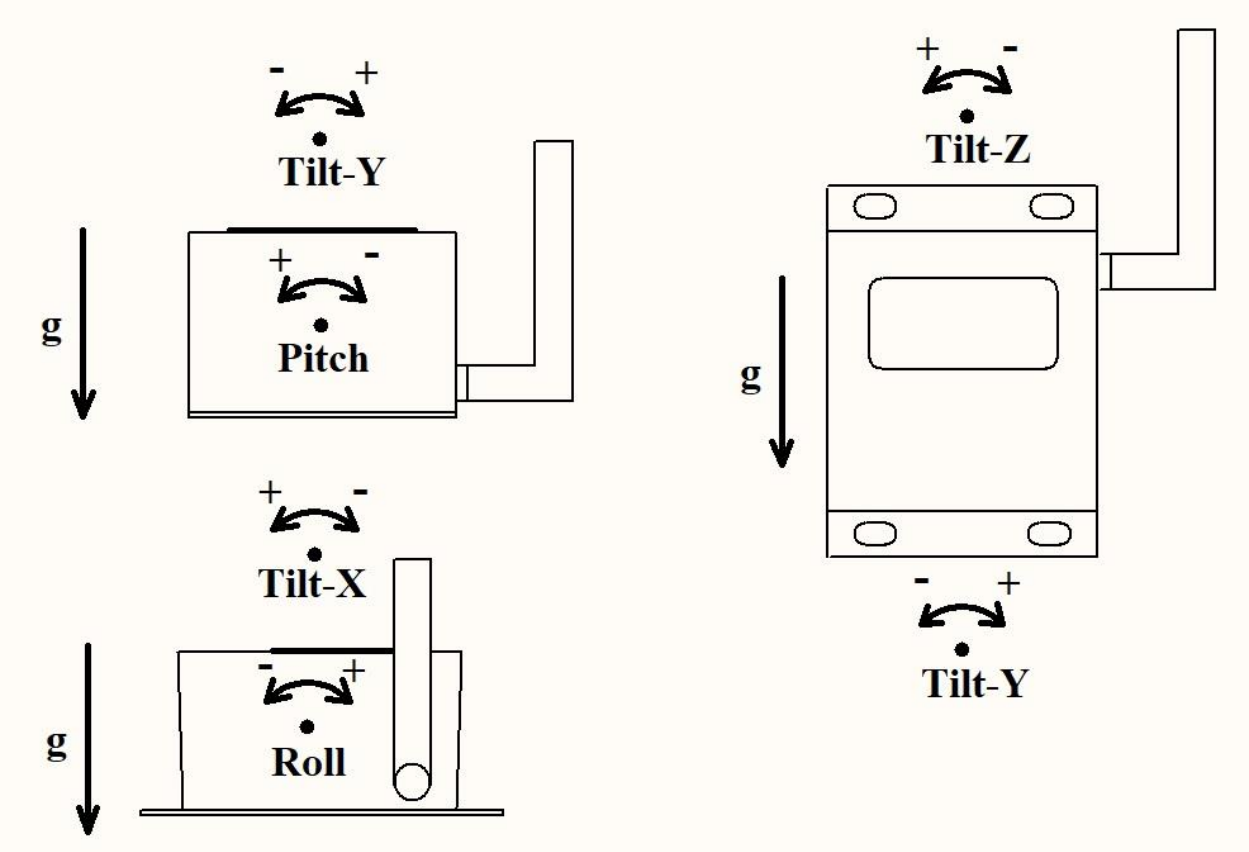

Figure 2: X, Y, Z, pitch & roll orientations

The data shown in SenScope™

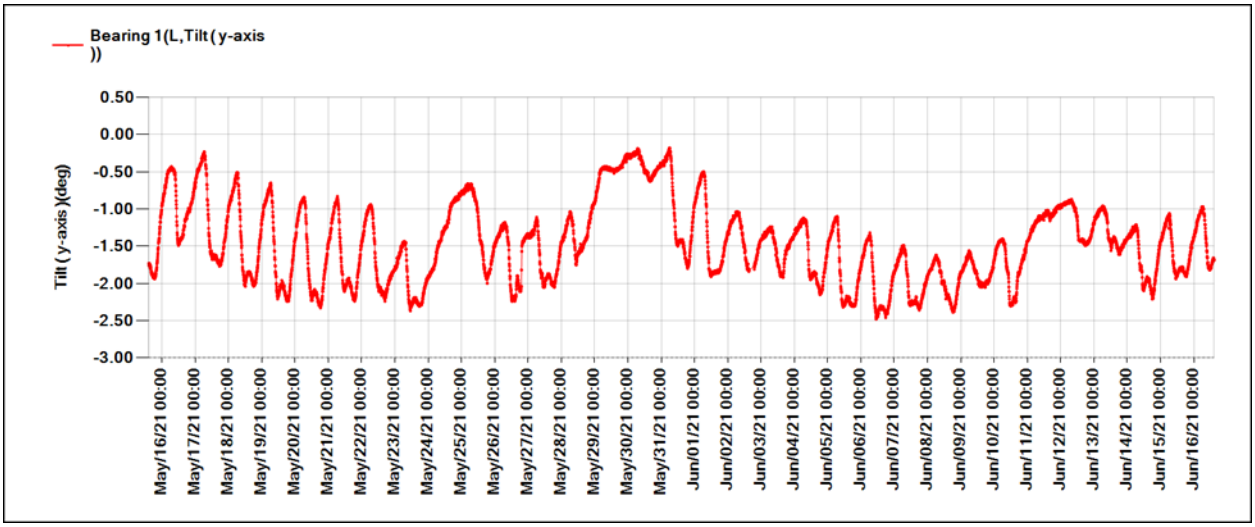

Figure 3: Tilt measurements for a MRT gauge