RESENSYS

SenSpot™ Wireless Scour Probe

Ultra-Low Power Precision Sensing & Wireless Communication

Typical Applications

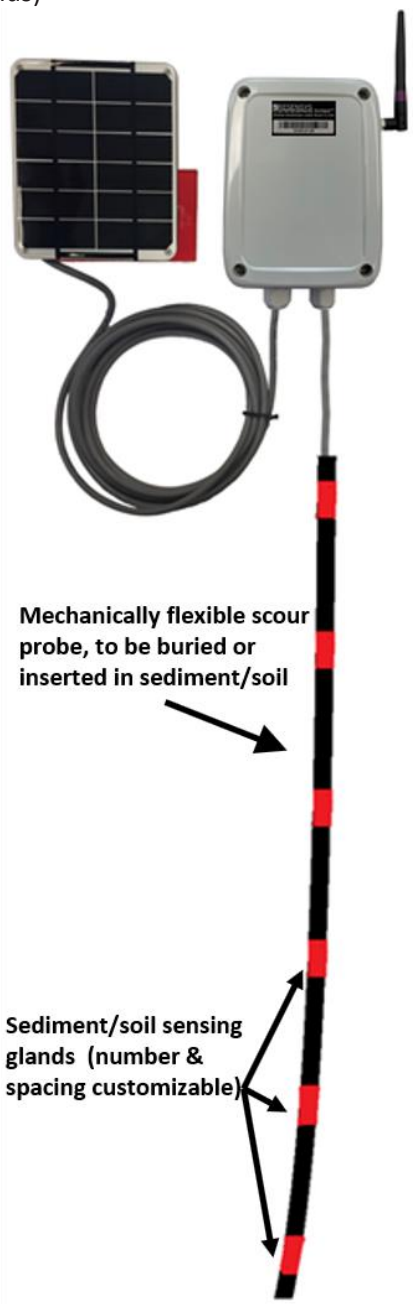
- Bridge scour monitoring
- Hydraulics monitoring
- Slope stability monitoring

Benefits

- **Long battery life:** 10 years typical
- **Wireless transmission:** No wiring is required for data acquisition
- **Lightweight:**
  - Wireless transceiver: 450 g (1 lb)
  - Scour probe: 0.8kg (1.8lb)
  - Solar panel: 100 g (3.5oz)
- **Easy mounting: Flange** mount or adhesive tape
- **Ingress Protection:** IP67, weatherproof, waterproof, protected against rain, snow, and UV exposure
- **Maintenance free:** No battery replacement, calibration or post-installation maintenance required

Specifications

- **Working temperature:** -40°C to +65°C (-40°F to +150°F)
- **Wireless communication range:** 1.0km (0.62mi) free space
- **Dimension (transceiver box):** 140mm (5.50”) x 105mm (4.12”) x 62mm (2.44”)
- **Customizable scour probe length:** 0.3m (1ft) to 30m (100ft)
- **Sediment detection glands:** up to 8 glands along sensing probe, custom spacing from 5cm (2in) to 3m (10 feet) between successive sediment sensing glands
- **Optional stainless-steel support:** The sensing probe can be encapsulated in a U-shaped stainless-steel profile in applications where the probe is inserted into sediment.
- **Temperature sensor:** each node a has a built-in temperature sensor with resolution of 1°C (Celsius)



Description

SenSpot™ wireless scour meter provides an easy way to install a scalable solution for measuring bridge scour, hydraulic damage, or slope stability.

Bridge scour refers to the removal of sediment such as sand, soil, and rocks from around bridge piers or abutments by fast moving flood current. It can cause erosion around the bridge piers or abutments. As scour occurs progressively, supporting material around the bridge foundation is removed and it can lead to settling or other forms of foundation instability.

Resensys Scour Probe SenSpot™ measures soil/sediment level close to the bridge foundation with a novel method that is completely different from current available methods. The probe or sensing element consists of up to eight sediment sensing glands that are connected to the electronic transducers through a cable. The nodes are located inside a waterproof mechanically flexible tube. The length of the tube (scour probe) and the spacing between successive sediment sensors can be customized according to the application needs. The probe can be buried to insert into sediment in locations with a high risk of scour. In applications where the probe is inserted into sediment, it can be encapsulated in a stainless-steel C-shaped or U-shaped profile, so it can be easily driven into the required depth using a hammer or similar tool.

Please see Figure1 for further details. Figure 2 shows schematic view of a bridge with installed wireless scour probe after erosion event. The SenSpot™ can detect whether each node is inside soil or water with a novel patented method. As a result, the river bed level range can be detected. The distance between each node is customizable according to customer needs. That gives customers flexibility and tradeoff between the necessary resolution and probe length which is decided based on the river depth.

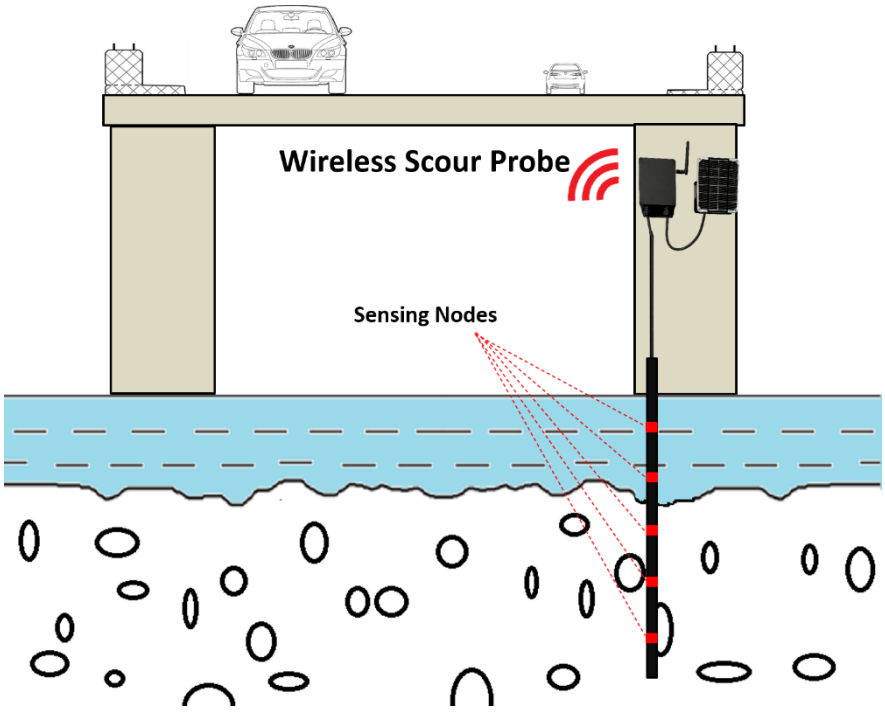


Figure1: Schematic view of a bridge with installed Wireless Scour Probe

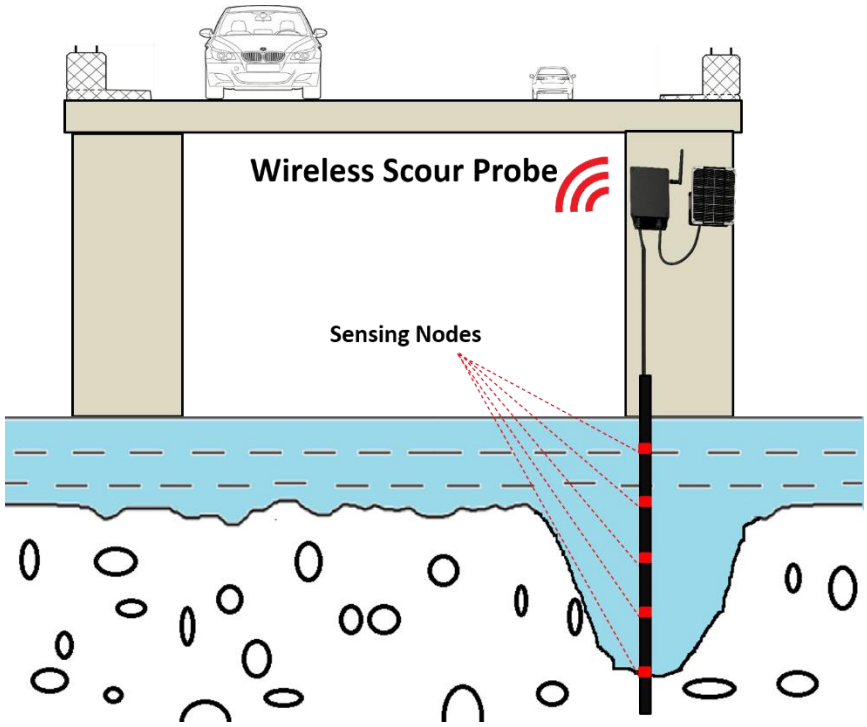


Figure2: Schematic view of a bridge with installed Wireless Scour Probe after erosion

Also, each node has a temperature sensor with resolution of 1°C (or 1.8°F) that allows further verification of whether the node is inside the soil or water. Typically, the temperature variations are smaller at nodes in the water comparing the nodes inside the soil.

Installation

Wireless transceiver box comes with mounting flanges. It can be installed either with screws and anchors through the flange holes or with VHB adhesive tape (for steel and smooth surfaces).

Wireless Transceiver Dimension

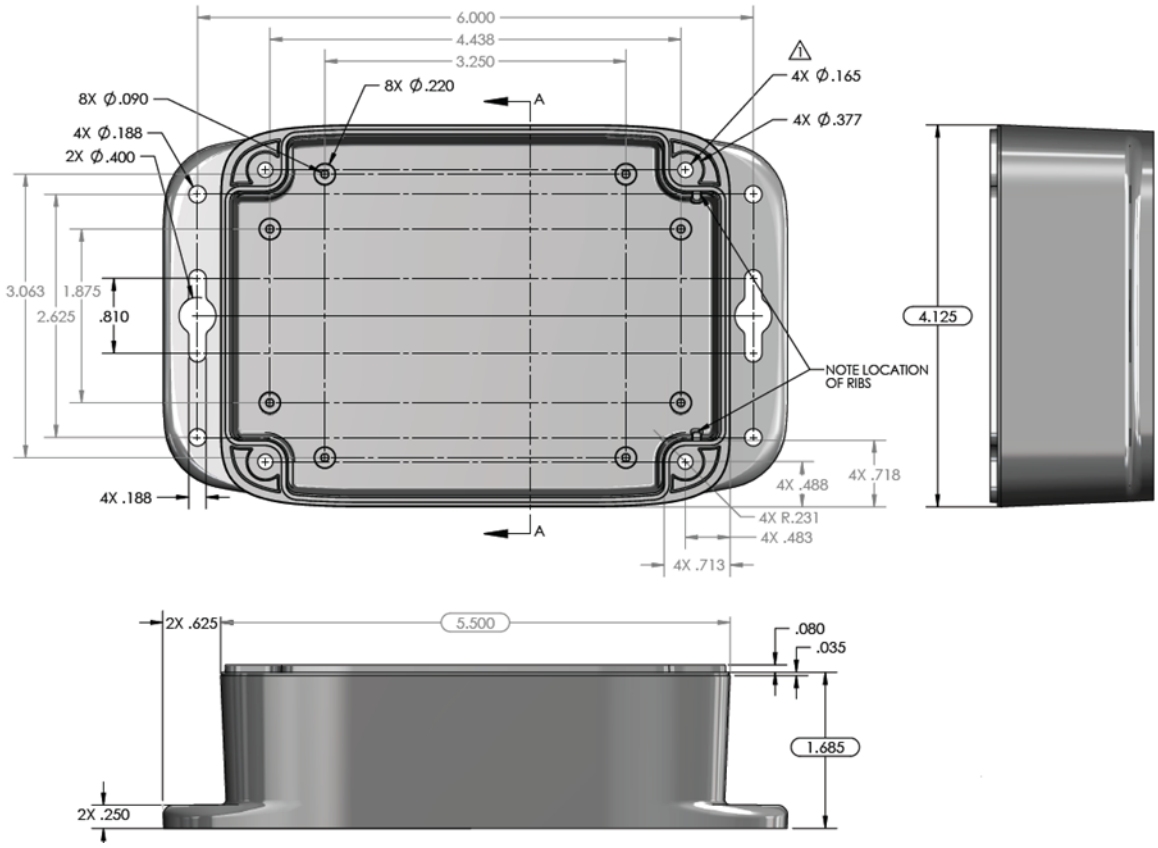


Figure3: Wireless transceiver dimension (in inch) for Wireless Scour Probe

The data shown in SenScope™

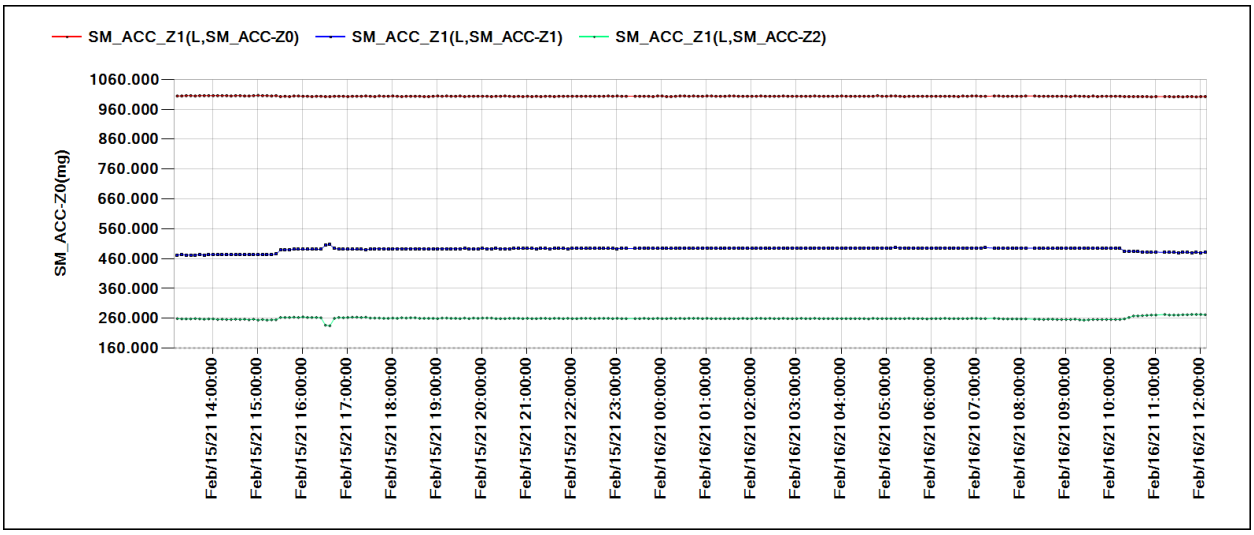


Figure4: Acceleration measurements for a Wireless Scour Probe on three different nodes

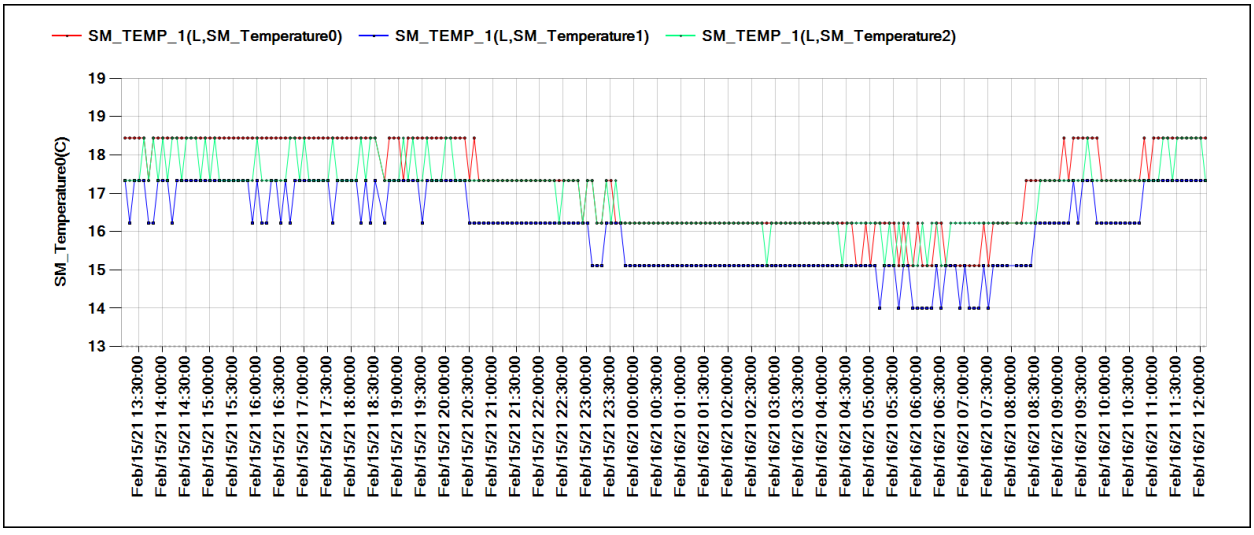


Figure5: Temperature measurements for a Wireless Scour Probe on three different nodes