

SONIC SURFACE SCANNER | Model S³

Automated imaging for condition assessment of slabs and pavements
Capable of meeting ASTM Standard C1383-15



About the S³

The Sonic Surface Scanner (S³) uses impact echo (IE) or sonic surface waves (SASW) methods to quickly and accurately measure concrete decks, asphalt pavements, and overlaid decks, nondestructively. With the S³ you can measure concrete slab thickness on undamaged slabs, detect corrosion delamination at top and bottom rebar mat, or locate other defects such as cracks, voids, honeycombing, debonding of concrete deck overlay, and asphalt pavement lifts.

Applications

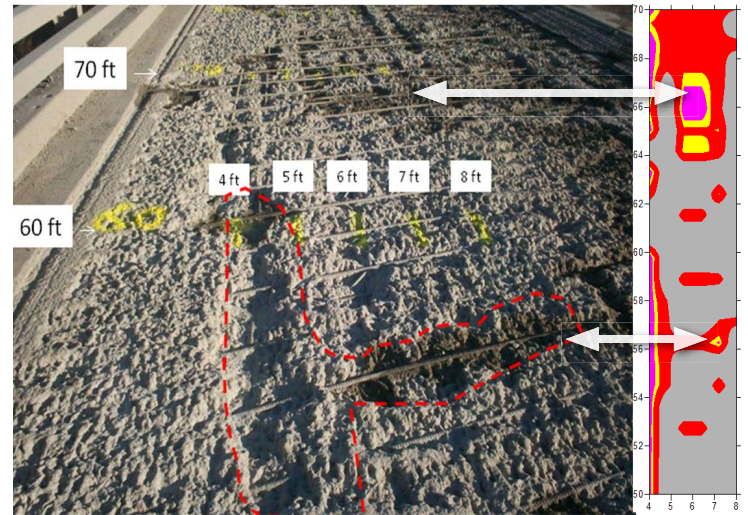
- | Bridge Decks
- | Parking Decks
- | Asphalt & Concrete Pavements
- | Airport Runways
- | Slab Track Railway
- | Dam Spillways
- | Slabs on Grade

Features & Benefits

- | Scan large areas quickly at 6 inch (15 cm) intervals
- | High-accuracy deck condition maps
- | Scan plain, reinforced, or post-tension slab construction
- | Easy to use single-person operation:
 - | Rugged
 - | Portable
- | Easy outdoor readable Dell™ Notebook
 - | Notebook meets MIL STD-810-G
 - | GPS Enabled
- | WinSSS acquisition & analysis software
- | Sensor wheels can be raised for easy turning and transport

Case Study: Asphalt Overlay

Ground Truth vs. S³ Results



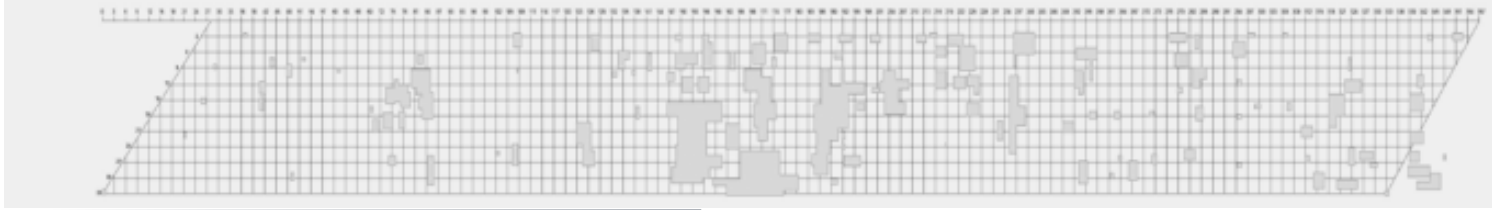
These two images represent an investigation of a bridge deck with a 3-inch asphalt overlay, which was tested with Impact Echo/Surface Wave methods. The Surface Wave tests identify delamination from rebar corrosion (shown in red and yellow in the image on the far right). The field photograph above shows the “ground truth” of the concrete deck which has been exposed by hydrodemolition of the overlaid asphalt and delaminated concrete. The data map on the far right displays the S³ survey results. Note that the arrows clearly indicate the excellent correlation between the S³ results with the ground truth of the exposed bridge deck.

How It Works

- 1** As the operator moves the S3 forward across a structural member and the two sensor wheels turn, the automatic solenoids on the side of the sensor wheels impact the concrete.
- 2** The compressional waves generated by the impacts travel through the concrete and are reflected from the bottom of the structural member, or from any hidden discontinuity.
- 3** The reflected wave energy is identified by the displacement transducers on the bottoms of the sensor wheels and the data is transmitted, in real-time, to Olson’s WinSSS-IE Software on the provided notebook.

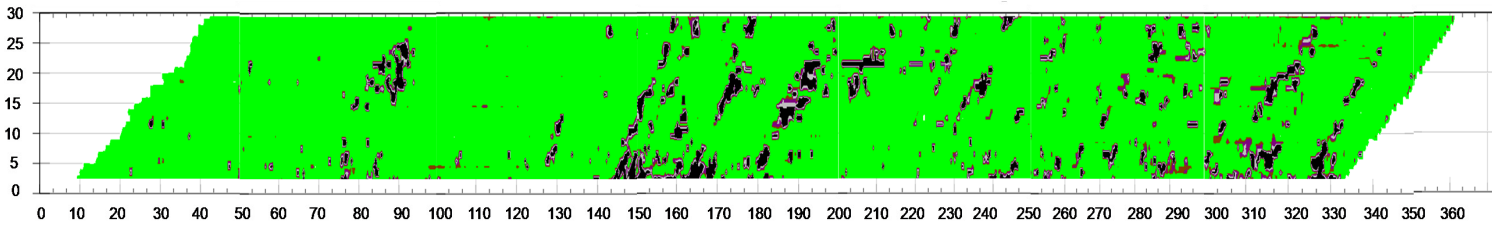
Case Study: Concrete Bridge Deck Investigation

Chain Drag Sounding vs. S³ Impact Echo Scanning



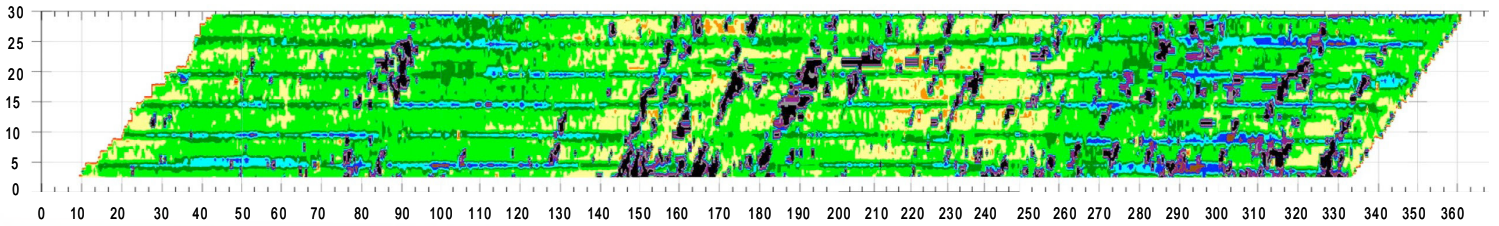
Standard chain drag delamination results

These results are from conventional chain drag methods.



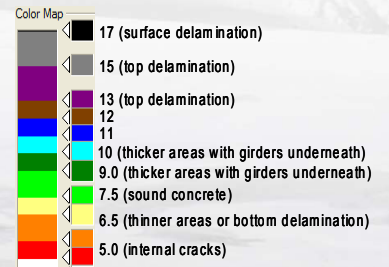
Impact Echo Top Delamination Results from the S³

This plot shows slab thickness data of sound concrete and areas of top rebar delamination detected by the Impact Echo S³ survey.



Impact Echo Scanning Results (Full-Depth) from the S³ with scan lines at 1 ft (0.3 m) spacing

The full depth results in this plot include mapped-out bottom delaminations as well as the presence of supporting girders under the bridge deck.



The S³ includes a rugged sunlight readable touchscreen notebook with GPS capabilities that you can use to review data in real time.



Olson Engineering & Olson Instruments

Olson Engineering Inc. specializes in *Nondestructive Evaluation and Internal Condition Assessment of Civil Infrastructure* as well as *Geophysical Services* for engineering purposes throughout the world.

Headquartered in Wheat Ridge, Colorado, USA, **Olson Instruments** specializes in *Nondestructive Evaluation* equipment for the civil engineering industry. We are an established manufacturer of sensors and data collection systems since 1993.

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Technical Specifications

Horizontal Sampling	0.5 ft (150 mm) In the direction of travel
Acquisition Speed	1.5 mph (2.4 km/hr)
Sampling Rate Point	10 μ S
Sensor Wheel Spacing	6, 9, 12, 24 inches (15, 23, 30 or 61 cm)
Depth Range	Thickness ranging from 3.5 to 18 inches (9 to 46 cm)
Software	Real-time, interactive 3-D condition mapping
Cart	Easily assembled composite hand cart
Weight	24 lbs (11 kg) ~ Cart
	39 lbs (18 kg) ~ Sensor wheel set
Overall Dimensions	66 x 30 x 42 inches (168 x 76 x 107 cm)

* Includes rugged Dell sunlight readable touchscreen laptop with GPS capabilities

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