

# APPLICATION EXAMPLE

Application:

**LONG TERM STRUCTURAL HEALTH MONITORING**

Structure:

HAMPDEN SUSPENSION BRIDGE

Location:

KANGAROO VALLEY, NSW, AUSTRALIA

Interrogator:

MOI si425-500



The Hampden Bridge over the Kangaroo River is the sole surviving suspension bridge from New South Wales' colonial period. Opened in 1898, the bridge was an outstanding engineering achievement for its time. Over one hundred years on however, the bridge is being subjected to far greater traffic loading than that for which it was originally designed.



The New South Wales Roads and Traffic Authority (RTA) must at all times assure the safety and structural health of the bridge while protecting and preserving the bridge's significant cultural heritage value.

To this end, the RTA commissioned Monitor Optics Systems to develop and implement a long term, automated, structural health monitoring system for the bridge.



Monitor Optics Systems developed and installed a fibre optics based strain sensing system on the bridge.

Surface mounted sensors measure strain in critical structural elements. The multiplexed sensors are routed to a control room at the bridge abutment.

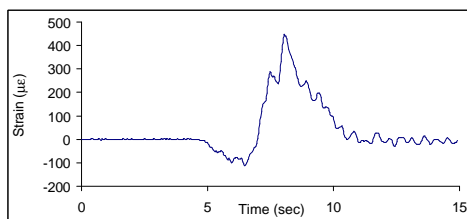
The Micron Optics si425-500 continuously interrogates the sensors. The acquired data is processed and transmitted automatically via GPRS.



The MOS Monitoring System provides a realtime measure of the structural condition of the bridge.

A detailed traffic loading profile is compiled from the accumulated data, permitting the development and policing of an appropriate traffic control regimen.

Tailored maintenance programs can be developed and the effectiveness of structural improvement can be assessed. When preset strain thresholds are exceeded an integrated camera can capture details of the overload vehicle.



Time (sec)	Strain (µε)	Strain (µε)	Strain (µε)	Strain (µε)	Strain (µε)
0.00	0.00	0.00	0.00	0.00	0.00
0.20	0.00	0.00	0.00	0.00	0.00
0.40	0.00	0.00	0.00	0.00	0.00
0.60	0.00	0.00	0.00	0.00	0.00
0.80	0.00	0.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	0.00	0.00
1.20	0.00	0.00	0.00	0.00	0.00
1.40	0.00	0.00	0.00	0.00	0.00
1.60	0.00	0.00	0.00	0.00	0.00
1.80	0.00	0.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	0.00	0.00
2.20	0.00	0.00	0.00	0.00	0.00
2.40	0.00	0.00	0.00	0.00	0.00
2.60	0.00	0.00	0.00	0.00	0.00
2.80	0.00	0.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	0.00	0.00
3.20	0.00	0.00	0.00	0.00	0.00
3.40	0.00	0.00	0.00	0.00	0.00
3.60	0.00	0.00	0.00	0.00	0.00
3.80	0.00	0.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	0.00	0.00
4.20	0.00	0.00	0.00	0.00	0.00
4.40	0.00	0.00	0.00	0.00	0.00
4.60	0.00	0.00	0.00	0.00	0.00
4.80	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00
5.20	0.00	0.00	0.00	0.00	0.00
5.40	0.00	0.00	0.00	0.00	0.00
5.60	0.00	0.00	0.00	0.00	0.00
5.80	0.00	0.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	0.00	0.00
6.20	0.00	0.00	0.00	0.00	0.00
6.40	0.00	0.00	0.00	0.00	0.00
6.60	0.00	0.00	0.00	0.00	0.00
6.80	0.00	0.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	0.00	0.00
7.20	0.00	0.00	0.00	0.00	0.00
7.40	0.00	0.00	0.00	0.00	0.00
7.60	0.00	0.00	0.00	0.00	0.00
7.80	0.00	0.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	0.00	0.00
8.20	0.00	0.00	0.00	0.00	0.00
8.40	0.00	0.00	0.00	0.00	0.00
8.60	0.00	0.00	0.00	0.00	0.00
8.80	0.00	0.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	0.00	0.00
9.20	0.00	0.00	0.00	0.00	0.00
9.40	0.00	0.00	0.00	0.00	0.00
9.60	0.00	0.00	0.00	0.00	0.00
9.80	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	0.00	0.00
10.20	0.00	0.00	0.00	0.00	0.00
10.40	0.00	0.00	0.00	0.00	0.00
10.60	0.00	0.00	0.00	0.00	0.00
10.80	0.00	0.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	0.00	0.00
11.20	0.00	0.00	0.00	0.00	0.00
11.40	0.00	0.00	0.00	0.00	0.00
11.60	0.00	0.00	0.00	0.00	0.00
11.80	0.00	0.00	0.00	0.00	0.00
12.00	0.00	0.00	0.00	0.00	0.00
12.20	0.00	0.00	0.00	0.00	0.00
12.40	0.00	0.00	0.00	0.00	0.00
12.60	0.00	0.00	0.00	0.00	0.00
12.80	0.00	0.00	0.00	0.00	0.00
13.00	0.00	0.00	0.00	0.00	0.00
13.20	0.00	0.00	0.00	0.00	0.00
13.40	0.00	0.00	0.00	0.00	0.00
13.60	0.00	0.00	0.00	0.00	0.00
13.80	0.00	0.00	0.00	0.00	0.00
14.00	0.00	0.00	0.00	0.00	0.00
14.20	0.00	0.00	0.00	0.00	0.00
14.40	0.00	0.00	0.00	0.00	0.00
14.60	0.00	0.00	0.00	0.00	0.00
14.80	0.00	0.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	0.00	0.00

Exclusive Value Added Reseller of  
**MICRON OPTICS INC.**  
 Sensing Instruments.  
[www.micronoptics.com](http://www.micronoptics.com)

