



## Structural Health Monitoring System



Client: Jiangsu Province Communications Department (JPCD)

Jiangyin Yangtze River Highway Bridge is the world's fourth longest suspension bridge with its main span of 1385m. It was opened to traffic in October 1999.

•Working in a consortium with Cleveland Bridge Ltd and James Scott, STRAINSTALL designed a structural monitoring system, developed from their Bridge Management System and combining their established DART (Dynamic Analysis in Real Time) technology with several innovative sensing systems. The key features of the bridge to be monitored are:

- Load in main cable strands at anchorages using magnetoelastic sensor equipment, newly available from Straininstall
- Hanger load with Straininstall load measuring pins at deck connections
- Deck, cable and hanger vibration using accelerometers and real time dynamic data processing with DART2 units
- Deck profile and cross-section movement using laser based optical system

The monitoring system comprises a fibre optic computer network, with a management workstation at the bridge office (off the bridge) and 8 DART2 outstations. The DART2s are sited close to groups of sensors for data collection, real time calculation and storage functions.

In normal operation mode, summary data is downloaded periodically to the management work station computer. Extra data is acquired and reported if an alarm condition is exceeded on any data channel. The system will also be used to build up a history of the bridge's structural and loading condition for use in future design work.

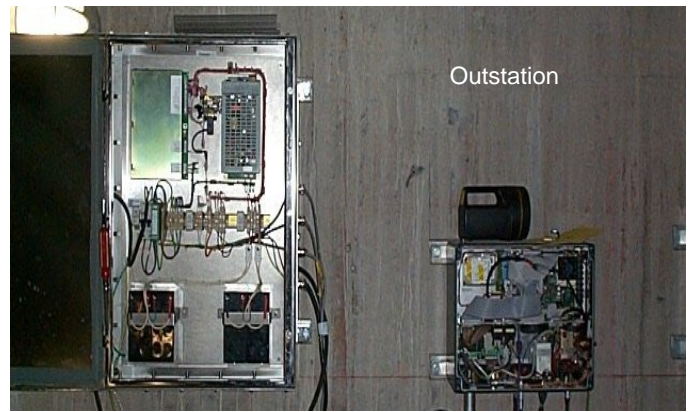
At the heart of the system, a network of eight Straininstall DART2s located at the outstations perform data acquisition and real time data processing functions remotely from the bridge management workstation.

Sensors include:

- Magnetoelastic (Dynamag) sensors for cable load
- Load Pins
- Accelerometers
- Laser system for deck profile



Workstation



Outstation



Laser Reflector on Deck Soffit is part of Deck Displacement Monitoring Sub-system



Load Measurement Pins at Hanger/ Deck Connections

Strainstall's team of experienced engineers operate from offices in Cowes, Bath and Aberdeen (UK) and Tønsberg (Norway). For further information, please contact:

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