

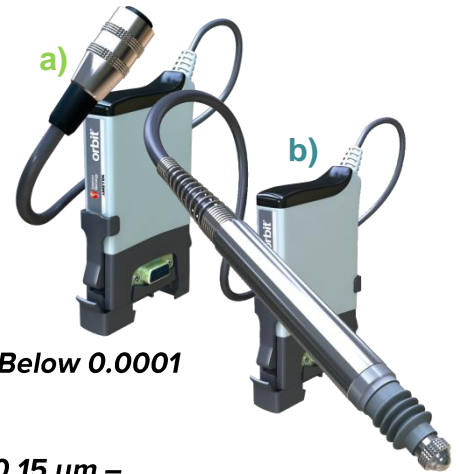
## Pre-stressed structures monitoring



*The nuclear power plant in Belleville sur Loire, France.  
Photograph: Herve Lenain/Corbis*

## The Product

The Orbit<sup>®</sup> 3 Network can be used to correlate many physical quantities such as force, pressure and displacement. The application demands a combination of accurate linear displacement and a current loop data. The flexibility of Orbit<sup>®</sup> 3 network allows the integration of highly accurate DP20S and the Analogue Input Modules



**a) Range: 4 to 20 mA – Accuracy: Up to 0.01 mA – Repeatability: Below 0.0001 mA – Resolution: Below 0.0001 mA**

**b) Range: 20 mm – Accuracy: Up to 4  $\mu$ m – Repeatability: Below 0.15  $\mu$ m – Resolution: Below 0.1  $\mu$ m**

## The Challenge

Test instruments for civil engineering monitoring are generally dedicated to specific applications and mastered fields. Structural monitoring, data logging and behaviour analysis are really important in Nuclear environment. It involves assessing the mechanical properties of prestressed concrete throughout the life of a power plant. Subsequent to the construction, Civil Engineering structures must remain under surveillance over the duration of their life cycles.



*Tricastin Power plant – efreyssinet- Association*

In order to maintain the construction's integrity, experienced experts in the industry study potential failures or weaknesses in the structure. They use hydraulic cylinders to apply a force on the structure walls and record movement associated with the pressure applied. Linear Displacement Transducers measure deflections and the force readings are fed to an analogue input. The Data Logging electronics is interfaced to a tablet PC via USB port and the PC is linked to a central server.

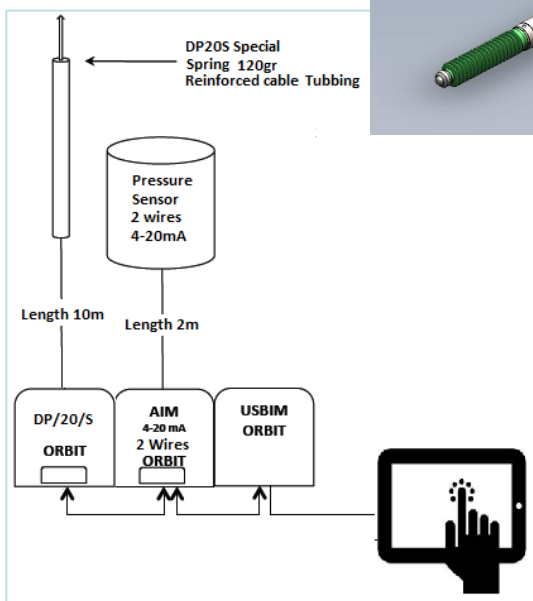
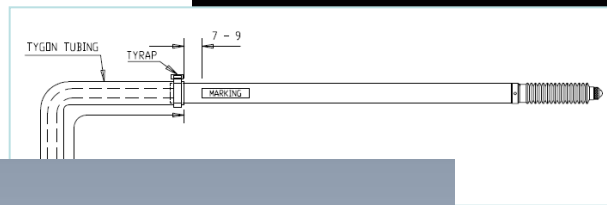
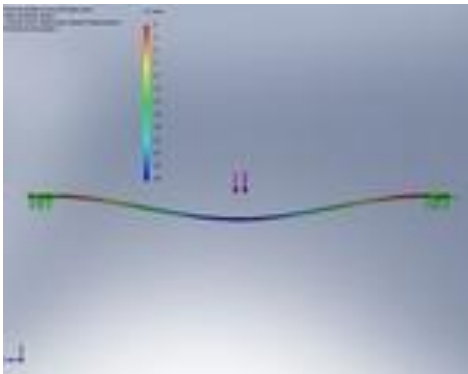
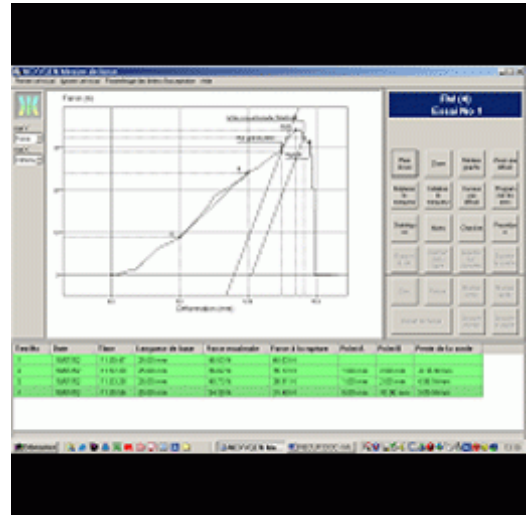
A software is designed in accordance with the customer's experience and requirements to produce a complete turn-key solution.

There are stringent and specific requirements for reinforced materials which are used in the nuclear environment

## The Solution

Solartron deployed 2 tests platforms based on their LVDT knowledge. A combination of DP Series LVDT and an Analogue input Module was selected by the customer and Solartron Metrology team. The readings are collected and synchronized via USB interface which also powers the sensor network.

A standard Windows based PC tablet was selected to run a software designed in the LABVIEW environment The Software developed by a third party specialist incorporates a large numbers of simple functions.



The combination of software and measurement tools dedicated to this particular application meets the user's objectives of ergonomics of a complete tool and ensures that the ease of use and maintenance is perfectly optimised.

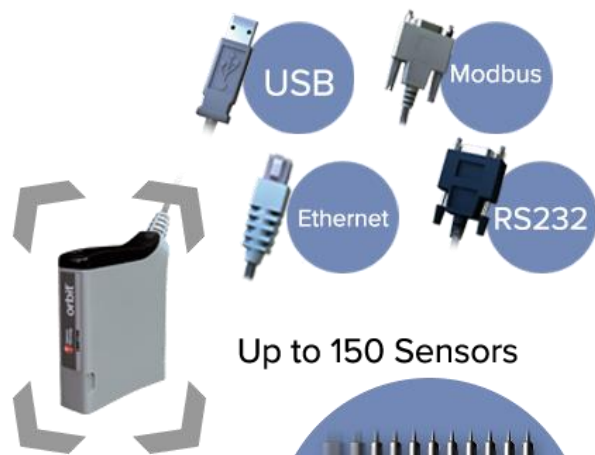
## Orbit<sup>®</sup> 3 – The Total Measurement System from Solartron Metrology

The Solartron Orbit<sup>®</sup> 3 Digital Measurement System, in conjunction with Solartron's wide range of transducers, including both contact and non-contact linear measuring transducers (gauging probes), specialist transducers and third party transducer interfaces, provides a limitless set of measuring system solutions, with numerous different interfaces to computers and PLC's, making Orbit<sup>®</sup> 3 completely flexible.

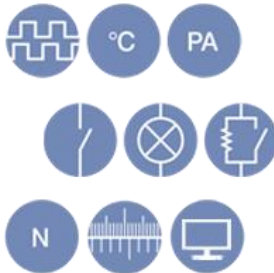
Supports all Solartron Sensors



Interface via USB, RS232, Ethernet and Modbus Output



Interface to various sensors and readouts



Up to 150 Sensors



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