



Olympic City Power Substation

Rio de Janeiro, Brazil

The Olympic Park is the main center of competition for the 2016 Summer Olympics in Rio de Janeiro. Covering over 1 million square meters and including 9 different sports facilities, a new power substation was constructed to handle the enormous power demand in the park. AP Sensing's fiber-optic based DTS (Distributed Temperature Sensing) solution was selected to monitor this valuable infrastructure.

The challenge

The responsible power company needed a **proven and reliable monitoring solution** that could be implemented on time as well as **easily integrated into the park's existing SCADA system and IT structures**. AP Sensing was selected because of **meeting IEC-61850 standards**, DNP3 capabilities, and because of our track record for reliability, flexibility and superior support services.

Power for the new facilities comes from two new circuits: the 12 km Gardenia and the 2 km Barra substations. One **AP Sensing Linear Power Series device with 6 channels – 3 for each substation** – was installed with a single-ended configuration.

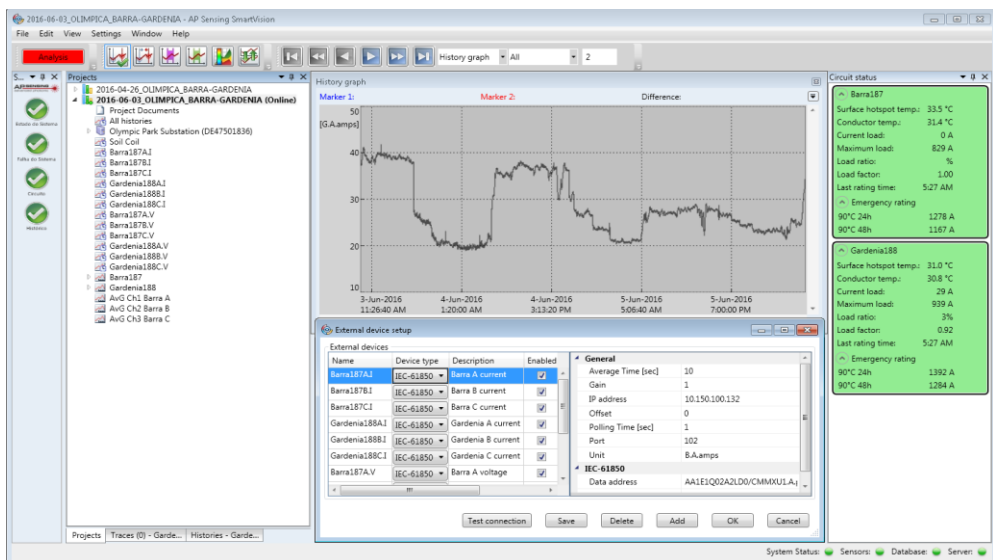
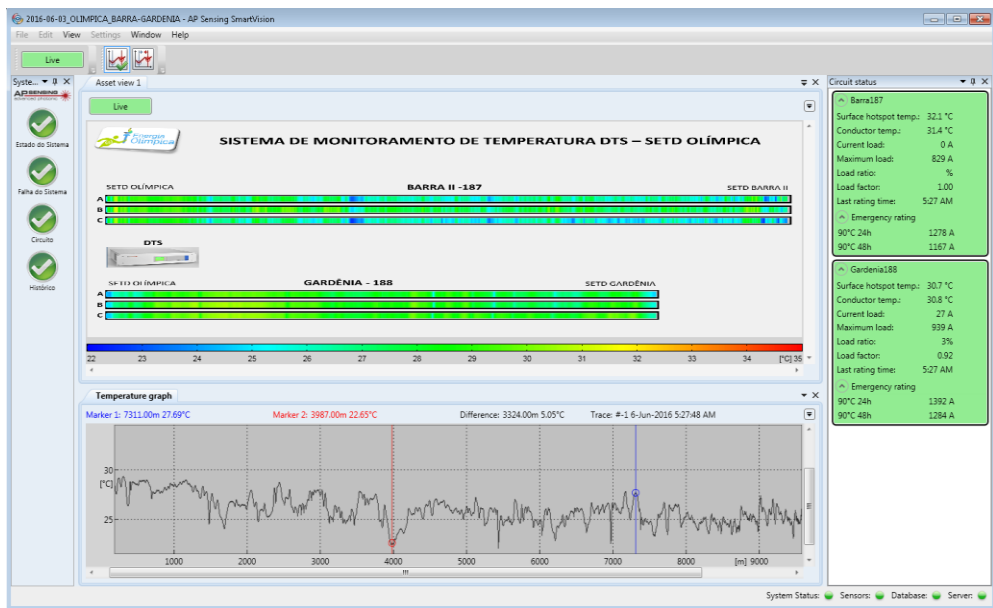
The longer circuit brought its own **specific challenges**, as it is **routed through diverse soil types and travels below a creek in a small concrete tunnel**.



Trefoil configuration in the substation; the GIS switching room

The installation was further enhanced with AP Sensing's RTTR (real time thermal rating) engine and our SmartVision information management suite. The RTTR engine constantly compares current loads with estimates made during planning, to calculate how much the steady-state load can be safely increased. This allows the network to run at the highest possible safe ampacity level.

SmartVision provides a color-coded asset visualization of all circuits in one overview. Temperature graphs and hotspot tables are always available and accessible. SmartVision also offers reporting and analysis capabilities, a central database and alarm management features. The control room is located in a building next to the switching room.



SmartVision asset visualization with IEC 61850 configurable box

The Olympic substation has **encapsulated bus bar, gas-insulated and underground cabling**, allowing the structure to be more compact. Its total power is 120 MVA, with three 3-phase transformers of 145 kV each, 51 armored sets of 15 kV and six sets of capacitor banks. **Underground extensions of high voltage 138 kV cable are used to connect the Gardenia and Barra substations.**



GIS termination showing the 3 phases

Presentations for the local team were carried out in **Portuguese**.

Ready for future growth: Plans are underway for the construction of an additional city adjacent to the Olympic City, which will mean ever-increasing power requirements in this fast-growing region.

AP Sensing is proud to have been selected for this important infrastructure project. When the Olympic competitions have ended, the **Olympic Park will house the first Olympic Training Center (OTC) in Brazil** -- the most modern in South America – to support South America's top athletes. Olympic Park will also include a research laboratory **to study nutrition and physical therapy, and will include a sports medicine clinic.**



The AP Sensing Linear Power Series