

Shanghai ScienceLand Museum

Automated Logic Corporation / Bei-Wong Automation



Situated in China, in the midst of Shanghai's beautiful Pudong financial district, is an awe-inspiring architectural monument to man's quest for scientific truth. It is the new Shanghai ScienceLand Museum. This world renowned project showcases the very best in every field and Automated Logic Corporation is proud to be among the elite selected to participate in this \$180 million project. The museum encompasses over 732,000 sq. ft., or 17 acres (68,000 sq. m.), and five major halls. The local Automated Logic representative, Bei-Wong Automation in Beijing, faced the challenge of



applying cutting edge technology to the project across a wide variety of environmental requirements. To meet this

challenge, Automated Logic's WebCTRL® system was selected because of its superb browser-based user interface, native BACnet open protocol, and its ability to utilize Chinese character fonts.

With approximately 3,200 control points and 1000 third party integration monitoring points, Bei-Wong Automation and the Automated Logic corporate office worked together to create a Chinese user interface to meet not only the requirements of this project, but also all future Chinese projects.

A wide diversity of areas required equally diverse control requirements. The architect, RTKL out of Los Angeles, worked with the Chinese government to create a union of halls that represent the symphonic harmony of nature and mankind. As a result, five major halls addressing the topics of Heaven and Earth, Life, Wisdom, Creativity and Future were created. In addition, a 75,400 sq. ft. (7000 sq. m.) central hall, an exhibition hall, and two IMAX theaters were added to the design. Each of these areas presented their own unique requirements for environmental control.

Over 100 air handling units, 300 exhaust and circulation fans and 7 heat recovery units are required to maintain environmental control in areas ranging from a marine and freshwater aquarium



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hall, to a large aviary to a greenhouse nursery. Other areas were equally challenging. A "hydro-power generation room" complete with small lake and dam, an indoor activity area with rock climbing, areas with custom lighting, physics exhibits, mechanical and electrical exhibits, all of which produce widely varying loads, all created unique challenges for the controls contractor.

In addition to controlling the airside equipment, the design also required the intelligent



staging control and monitoring of a boiler plant having 3 boilers. Other systems such as the waste and city water pumping system,

350 lighting systems and the building elevators each also required their own unique control and monitoring, alarming and trending schemes.

A project of this magnitude requires a control system flexible enough to interface with a multitude of vendors, providing monitoring, alarming and trending capabilities through one system. One of the greatest benefits of an open protocol, browser-based system is the ability to do this, presenting all vendor information graphically through one unified control system. While there are still many proprietary protocols in use, many vendors are beginning to see the benefits of converting to an open protocol based system. On this project, the following third party systems were brought together and presented by the BACnet supervisory system.

Close to 300 chiller system points from a Siemens/BAC thermal storage plant are being monitored, alarmed, trended and linked to the front-end graphics. Chiller statuses, pump statuses, temperatures, valve positions, setpoints, and mode of operation are all being translated from a Siemens ASCII full alphanumeric protocol into BACnet, presenting all the data through the BACnet supervisory system.

Over 200 life safety and fire system points

from a Siemens/Cerberus Fire Alarm System are being monitored. Such points as pull station statuses, smoke detector statuses, fire alarms and fire protection pump statuses are all being monitored, alarmed and trended, retrieving the data from a Siemens/Cerberus system via a BACnet translator. Up to 70 doors are being monitored for open, closed and alarm statuses through a Ultrak Access control system. Information on these points is being brought into the BACnet system so they can be alarmed and trended at the central site computer.

Six ITT Bell & Gossett variable frequency drives panels are also being monitored. Each panel controls their own group of pumps modulating to maintain various chw loop pressures. These panels are already networked together by BACnet, so it is easy for the WebCTRL® system to monitor such things as temperature, pressure, pump statuses, VFD statuses and alarms. All of these points are alarmed and trended at the central site computer.

A Westinghouse-Cutler Hammer power monitoring system provides data such as breaker currents and voltages, to the central system via custom

html webpage format. This format allows the data to be presented to the building operators as part of the WebCTRL



system, allowing for easy monitoring along with the other systems through a single supervisory system.

The Shanghai ScienceLand Museum truly represents the possibilities of a multi-vendor unified control system. Built to celebrate scientific achievement, the Shanghai ScienceLand Museum is itself a tribute to the science of building design. Automated Logic and Bei-Wong Automation of China are proud to be a part of this magnificent edifice to scientific progress.



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