

ASHRAE and manufacturers of IT equipment have recommended operating temperature ranges for inlet air to data center IT equipment in the range of 64.4-80.6°F. The cooling units are normally controlled in a standalone, decentralized mode based on return air temperature to the cooling unit, rather than inlet air temperature to the servers. This often results in over-cooling, and wasting energy.



At the California Franchise Tax Board Data Center, steps were taken to improve the efficiency via several steps that included:

- ✓ Installation of wireless temperature sensors and power-monitoring data loggers
- ✓ Repositioning floor tiles to improve air distribution
- ✓ Retrofitting computer room air handling (CRAH) units with Variable Frequency Drives (VFDs) to modulate fan operation
- ✓ Installing automated software to provide temperature control
- ✓ Installing hot-aisle containment curtains to isolate server hot-aisle airflow
- ✓ Blanking of openings in the racks to prevent airflow “short circuits” through the racks

The new software system needed to communicate to the Computer Room Air Handlers (CRAH). The software utilized Modbus, while the CRAH used BACnet/IP. Since the key component in making this new design function fully was data integration, it was necessary to devise a way for the new software network to interface to the CRAH and the integrator came to Sierra Monitor for a solution.

The FieldServer Model FS-B2010 was selected to provide this important data integration solution. Sierra Monitor is known as a leader in gateway technology and drivers for the Building Automation Industry.



With interoperability capability between the CRAH and the new software system, plus the VFDs, the system was able to eliminate data center load by reducing fan speeds and turning CRAHs off when not needed. It is estimated that the project eliminates 475,239 kWh per year which is 21.3% of the baseline energy consumption of the data center prior to the installation.