



# Turnkey Installation Provides 1120 Vermont Avenue Cost Competitive Solution

The 1120 Vermont Avenue North West Building in Washington DC is owned and managed by a local prominent real-estate agency. The building houses multiple government offices including the Department of Homeland Security, SAIC, Lockheed Martin and the Federal Railroad Administration. This 500,000 sq ft (approx. 152,400m<sup>2</sup>), 12-storey building with a 1986 era DDC system was in need of new building controls that would allow for greater reliability, better response to tenant needs, and permit web-based multi-user management of the system.

## The Challenge

Being a vintage, the system was slow and there was no retrospective compatibility from the manufacturer, available. The building owners required a new system that would offer reliability, flexibility and provide web access for duty personnel and others. Since the facility is occupied 12 hours per day, 6 days per week and the tenants required consistent performance of the system, it was important to conduct the installation without any tenant downtime.

## The Solution

The building owners turned to Computerized Controls, an Authorized Distech Controls Open Systems Solution Provider. Working under competitive conditions, Computerized Controls negotiated with the owner a turnkey installation for this project, because they had demonstrated over ten years that they could provide the most competitive solution with a truly open system that met the owners' requirements.

Indeed, Computerized Controls worked with the owner in specifying and providing an open control system that would protect the owners' interests and provide a cost competitive solution, from installation through to maintenance. Computerized Controls installed Distech

Controls' LONWORKS based EasyControls™ free programmable controllers. The network was implemented using Distech Controls' LonWatcher LNS® based network management tool and web-based access was established with Plexus' web browser.



## The Mechanical System

The HVAC system is designed as a 4-pipe chilled and hot water system with the airside consisting of AHUs, VAVs and FCUs. The system components include:

- three centrifugal chillers (500 ton, 350 ton and 200 ton)
- a 500-ton plate heat exchanger
- a primary and secondary chilled water system with 150 HP variable frequency drive (VFD)
- a 240 KW generator for demand limiting and backup with 8 transfer switches
- three 500-ton cooling towers with six 30 HP VFD controlled tower fans
- a tenant 24 hour system with two 300-ton cooling towers and a heat exchanger with open and closed loop pumps all with VFDs
- two hot water boilers with interior and exterior hot water pumps with VFDs
- two steam boilers for building humidification

The air system consists of 748 perimeter 4-pipe fan coil units (FCUs), 240 interior/floor VAVs and 28 air-handling units (AHUs).

## The Controllers

The controllers were replaced in a phased approach, allowing for all work to be completed without taking systems off-line during occupied hours. To control

the mechanical system, Computerized Controls installed EasyControls free programmable controllers:

- EC-8Cs for the 748 FCUs
- EC-VAV-CFs for the 240 VAVs
- EC-12Bs for the 28 AHUs

Control of the chillers, pumps, cooling towers, boilers and generators was accomplished with EC-12Bs and ECU-88s.

The Free Programmable controllers allowed for complete customization of the functionality and operation of each mechanical unit, fully adapting the system to the specific needs of building management and tenants, as well as easily integrating the controllers to the older mechanical system already in place. In total, the installation required over 700 free programmable controllers providing more than 8500 points of control.

The LNS based plug-ins, available as freeware from Distech Controls, allowed fast and easy custom programming of the controllers. Custom programming is facilitated by the plug-ins' intuitive graphical interface and its power and flexibility as a code editor, debugger and compiler.

### The Network

Although the network wiring was completely replaced, some wiring and control relays were reused inside the panels, after testing and verification. A high-speed TP- 1250 LON backbone and separate 78 kHz LON buses were installed on each floor. Two routers per floor ensure LON® to LON communication within the network, as well as increased network reliability.

In order to create a web-based GUI capable of handling such a large amount of devices and data, a large Rittal enclosure, mounted in the penthouse engineer's office, houses 13 Plexus® NSX 1000 Servers with 128 nodes each, network switches and UPSs to serve each floor's devices; allowing for LON to Ethernet communication and data transfer. The Plexus server is used to monitor global activity, such as alarms, trend logs, schedules and to visualize the customized Web pages.

Furthermore, a PC based server running Distech Controls' LNS based network management tool, Lon-Watcher, is used for the engineering of the network, the database management and archiving of logs and histories. LonWatcher allows easy operation of all administrative functions required by building management, namely the management of common web-page access for the multiple user accounts.

Because of its tree-view oriented design and simple to use interface, LonWatcher not only permits fast and cost efficient implementation of the devices, it is also an end-user friendly tool with all of the resources needed to develop, maintain, and access the LONWORKS system, reducing training requirements and improving maintenance efficiency.

### The Benefits

The installed system has already greatly improved comfort levels for all tenants and provides better control and monitoring of energy consumption. Since the replacement of the controllers in 2005, building management has benefited from annual energy consumption savings of US \$500,000. The new system provides for adapted and customized response to the needs of each office and each tenant and offers building owners both centralized and remote monitoring, control and support.

#### Contact:

Distech Controls  
Tel. +1 450 444 9898  
sales@distech-controls.com  
www.distech-controls.com



550 Meridian Avenue  
San Jose, CA 95126, USA  
Tel: +1 408-938-5266  
www.lonmark.org