October 5, 2023

Ms. Madeleine Babick
New York State Department of Environmental Conservation
Hunters Point Plaza
47-40 21st Street
Long Island City, New York 11101

Subject: Corrective Measures Plan
Site Name: Mott Haven Campus / Public School X790
Site Address: 730 Concourse Village West, Bronx, NY
BCP Agreement: C-203030

Dear Ms. Babick:

ATC Group Services LLC (ATC) doing business as (dba) Atlas Engineering Inc. (Atlas) on behalf of the New York City Department of Education Office of Environmental Health and Safety (DOE/EHS) is pleased to submit this Corrective Measures Plan to the New York State Department of Environmental Conservation (NYSDEC) for Mott Haven Campus (X790) located at 730 Concourse Village West, Bronx, New York. (Site).

A one-acre area of the Mott Haven Property was accepted into the Brownfield Cleanup Program (BCP) and underwent remedial action from July 2006 to October 2007. A Site Management Plan (SMP) was generated to ensure operation, maintenance, and effectiveness of the Engineering Controls (ECs) and Environmental Easement (institutional controls). The BCP Area and the remainder of the property are addressed by the SMP. The ECs include a Gas Vapor Barrier and a sub-slab depressurization system (SSDS) constructed beneath the school to prevent residual soil vapors from entering the Mott Haven Campus buildings.

Atlas submitted a Site Management Periodic Review Report on May 23, 2023 to the NYSDEC for the certification period of August 30, 2021 through February 16, 2023 that was subsequently accepted by the NYSDEC on July 21, 2023. It was documented in this report, that during Atlas' on-site inspections on August 10, 2022 and March 31, 2023, that although all six (6) fans were operational, the BMS was not monitoring these SSDS fans. As an interim measure for the BMS, the custodial staff was directed to complete daily checklists for each fan unit **as outlined in the SMP revised October 21, 2019**. These daily inspections are being completed until the BMS functionality has been corrected.

On a virtual meeting conducted on August 18, 2023 that included the following participants: the NYSDEC, the NYCDOE/EHS and Atlas, the NYSDEC required that a new system be installed to monitor the SSDS fans. This proposed system will be required to send out notifications to various parties in the event of an SSDS alarm. The NYSDEC requested that a Corrective Measures Plan be submitted to the NYSDEC by October 9, 2023.

Below are steps taken to adhere to the requirements set forth by the NYSDEC.

Task 1: Installation of new software (August 2023 through December 2023)

After testing out this software in other schools, Niagara was chosen to replace the current BMS software. The Niagara software not only monitors the SSDS, but all other systems in the building. Niagara provides the critical, cyber-secure device connectivity and data normalization capabilities needed to acquire and unlock operational data from device-level and equipment-level silos. The control engine at the core of Niagara enables users to not just monitor data flows, but to create logic sequences that effect controls programming based on data observation. Systems integrators use the data management and user presentation applications built into Niagara to manage histories, schedules and alarms. They can create custom user interfaces for end users with the tools built into Niagara, or purchase graphical UI templates and components from the many Niagara partners that specialize in graphics and dashboarding.

Based on information provided by the NYCDOE, there will be a Niagara BMS user interface on the computer located in the Custodial Engineer's office. This program will have a visual alarm page. Should one of the SSDS fans go into an alarm, the Custodial Engineer will have to acknowledge the alarm and fix the issue. In addition, when the SSDS goes into alarm, an email will be sent out to the parties as specified to be alerted of the alarm. Parties to be notified include: NYSCDOE EHS, On-site Custodial Engineer, the Deputy Director or Facilities (DDF) and the NYCDOE Environmental Consultant (Atlas). Following the email notification, the NYCDOE EHS will follow-up with on-site staff (Custodial Engineer). Should the alarm issue not be resolved within 8 hours, a second email/alarm will be sent.

The BMS upgrade began in July 2023 and is set to be completed in January 2023. The following Table outlines this timeline.

Table 1. BMS Upgrade Timeline

Completion Date/ Estimated Completion Date	Task Item Description
July 2023*	Control Contractor/System Integrator (RGBS) provided Mott Haven Campus Engineering drawing set and was reviewed by the NYCDOE
July 2023*	RGBS ordered the materials (Distech controller, relays, thermostat, actuator, sensors and Niagara software)
August 2023*	RGBS developed a custom controller program to address all systems at the school including the SSDS at controls company office
September 2023*	RGBS uploaded Niagara software to DOE servers on site
October 2023	Electrical contractor (A@S electric) will install fan power box controller (in ceiling of classrooms) in Building A, B, C and D. This is interior room level work for non-SSDS related components.
October 2023	RGBS will start integrating controller into Niagara database at the end of each shift. This is to provide a functional BMS as the upgrade process is taking place and also test device for functionality.
Begin November 2023	RGBS will start changing out RTU/AHU and monitoring panel (on the roof, associated with each fan) at the starting of November 2023 (roof level). This is for all systems, but SSDS will take first priority
December 2023	RGBS will replace controller for Building A for SSDS panel
December 2023	RGBS will replace controller for Building B for SSDS panel

Table 1. BMS Upgrade Timeline	
December 2023	RGBS will replace controller for Building C for SSDS panel
December 2023	RGBS will replace controller for Building D for SSDS panel
December 2023	RGBS will complete graphics and alarming following controller installation

* Task Item Completed

Task 2: Pilot Test Program

Following the completion of Task 1, NYCDOE will test the BMS system and its notification system for a SSDS alarm during unoccupied hours. The alarm will be visible on the new custodial engineer workstation in office. Email address(s) will be entered into software for email notification. Confirmation of the email notification in the event of an SSDS alarm will be conducted. The duration for these tests and installation will be 1 month. The test program is estimated to be completed in January 2024.

Task 3: Environmental Oversight / Updates

Atlas will conduct periodic meetings, as necessary, to confirm the progress of the BMS upgrade until the new SSDS software has been fully integrated. Atlas will be present during the Pilot test program at the Mott Haven Campus. Once the system is completed and tested, the NYSDEC will be notified and a Corrective Measures Report will be completed and included with the Site Management Periodic Review Report to be submitted in 2024.

Should you have any questions or comments regarding this report please do not hesitate to contact the undersigned.

Sincerely,

Gilbert Gedeon, P.E.
Principal Engineer

Denise Cosenza
Project Manager

Attachments:

- Niagara Fact Sheet
- Outline of BMS Architecture
- BMS Monitor Visual Samples (BMS Home Page, BMS Alarm Page, SSDS Graphic)
- System Components (Controller, Disctech Controller, Current Sensor)

data sheet

niagara4 supervisor

PRODUCT DEFINITION

The Niagara Supervisor is part of the portfolio of Java-based controller/server products, software applications and tools powered by the Niagara Framework®. It provides server-level functions for a network of JACE, Niagara Edge® and other field devices. The Niagara Supervisor serves real-time graphical information to standard web-browser clients and performs essential functions such as analytics, centralized data logging/trending, archiving to external databases, alarming, dashboarding, system navigation, master scheduling, database management and integration with other enterprise software applications. Additionally, the Niagara Supervisor provides a comprehensive graphical engineering toolset for application development and configuration.

The Niagara Supervisor allows the networking of multiple Niagara-based JACE® and Niagara Edge® controllers, along with other IP-based controllers and field devices. It enables the design, configuration and maintenance of a unified, real-time controls network.

key features

- Centralized system management
- Utilize tags to quickly navigate to buildings, systems and equipment when diagnosing operational problems or emergencies
- Compare data between buildings
- Export system data to external databases
- Integrate a Building Automation System (BAS) with other enterprise applications
- Integrate with other applications, such as work order management, analytics, etc.
- Single tool used to program JACE, Niagara Edge controllers and Supervisor
- Remotely back up JACE and Edge applications to Supervisor
- Batch provisioning of JACE and Edge firmware upgrades, security credentials, applications and commissioning options from Supervisor
- Robust built-in analytic capabilities supported by standard Niagara components and visualizations
- Includes Niagara Analytics, which features data source, functional and mathematical programming blocks that enable sophisticated analytic algorithms
- Compatibility with Niagara Enterprise Security access control and security application. Allows integration of BAS and access control to save energy and optimize operations
- Eligible for accreditation under the Federal Risk Management Framework (RMF)
- FIPS 140-2 Level 1 conformance available

powered by niagara framework®

SPECIFICATIONS

Features a HTML5 and Java-enabled user interface (UI), and includes a JavaScript data interface library (BajaScript)

Supports an unlimited number of users over the internet/intranet with a standard web browser (depending on the host PC resources)

Optional enterprise-level data archival using SQL, MySQL or Oracle databases, and HTTP/HTML/XML, CSV or text formats

"Audit Trail" of database changes, database storage and backup, global time functions, calendar, central scheduling, control and energy management routines

Sophisticated alarm processing and routing, including email alarm acknowledging

Access to alarms, logs, graphics, schedules and configuration data with a standard web browser

Niagara follows industry best practices for cyber security, with support for features such as strong, hashed passwords, TLS for secure communications and certificate management tools for authentication. A built-in Security Dashboard provides a comprehensive and actionable view of the security posture of your Niagara deployment

HTML-based help system that includes comprehensive online system documentation

Supports multiple Niagara-based stations connected to a local Ethernet network or the internet

Provides online/offline use of the Niagara Framework® Workbench graphical configuration tool and a comprehensive Java Object Library

Optional direct Ethernet-based driver support for most Open IP field bus protocols (see supported drivers document)

SOFTWARE & DRIVERS

Every Niagara Supervisor comes with a Niagara 4 software license, along with multiple open-protocol IP drivers that are compatible with standard control networks. If required, other drivers can be purchase separately. For an up-to-date list of supported drivers, visit the resource library on tridium.com.

SOFTWARE MAINTENANCE

Purchase of a software maintenance agreement (SMA) is required with initial Niagara Supervisor licensing. The initial SMA is for 18 months, with extended agreements of 3 years and 5 years available for discounted rates.

If a Software Maintenance Agreement is not in effect for any period, the price of maintenance for the next period for which it is purchased will be priced at a cost equal to the maintenance fee for the period(s) for which maintenance was not purchased, up to a maximum of 5 years, plus the maintenance fee for the next year.

For an up-to-date list of supported drivers, visit tridium.com.

ORDERING INFORMATION

Part number	Description
SUP-0	No Niagara network – Devices only. 18mo SMA required
SUP-0-SMA-INIT	18mo initial SMA required (3YR or 5YR can be substituted)
SUP-1	1 Niagara network connection* (18mo SMA req)
SUP-1-SMA-INIT	18mo initial SMA required (3YR or 5YR can be substituted)
SUP-2	2 Niagara network connections* (18mo SMA req)
SUP-2-SMA-INIT	18mo initial SMA required (3YR or 5YR can be substituted)
SUP-3	3 Niagara network connections* (18mo SMA req)
SUP-3-SMA-INIT	18mo initial SMA required (3YR or 5YR can be substituted)
SUP-10	10 Niagara network connections* (18mo SMA req)
SUP-10-SMA-INIT	18mo initial SMA required (3YR or 5YR can be substituted)
SUP-100	100 Niagara network connections* (18mo SMA req)
SUP-100-SMA-INIT	18mo initial SMA required (3YR or 5YR can be substituted)
SUP-UNL	Unlimited Niagara network connections* (18mo SMA req)
SUP-UNL-SMA-INIT	18mo initial SMA required (3YR or 5YR can be substituted)
SUP-UP-1	Adds 1 additional Niagara connection to Supervisor
SUP-UP-100	Upgrades small Supervisor to 100 Niagara connections
SUP-UP-UNL	Upgrades Supervisor 100 to unlimited Niagara connections
SUP-DEVICE-[10, 25, 50, 100, 200, 500, 1000]	[10, 25, 50, 100, 200, 500, 1000] device upgrade (standard drivers included)
SP-S-FIPS	Provides FIPS 140-2 Level 1 conformance for 4.6 and later
SUP-[0-UNL]-SMA-[1,3,5]YR	Supervisor [0-UNL] Maintenance – [1,3,5] YR extensions

*Niagara Edge 10 or OEM devices 'powered by Niagara framework' with a 150 points or less based capacity license now count as a 1/10 of a standard Niagara Network connection

NIAGARA CONTAINERS

Supervisor models are also available for deployment in containers as subscription licensing (subject to necessary subscription agreement):

Part number	Description
NCC-SUP-[0, 1, 10, 100, 500]	Subscription for 1 Year for N4 Niagara Core Container Supervisor with [0, 1, 10, 100, 500] Niagara connections
NCC-SUP-UP-[1, 10, 100]	Subscription for 1 Year for N4 Niagara Core Container Supervisor upgrade for [1, 10, 100] Niagara connection
NCC-SUP-DEV-10	Subscription for 1 Year for N4 Niagara Core Container Supervisor 10 field device pack (Standard drivers included) up to 500 points
NCC-SUP-DEV-50	Subscription for 1 Year for N4 Niagara Core Container Supervisor 50 field device pack (Standard drivers included) up to 2500 points
NCC-SUP-DEV-100	Subscription for 1 Year for N4 Niagara Core Container Supervisor 100 field device pack (Standard drivers included) up to 5000 points
NCC-SUP-DEV-500	Subscription for 1 Year for N4 Niagara Core Container Supervisor 500 field device pack (Standard drivers included) up to 25000 points
NCC-SUP-DEV-1000	Subscription for 1 Year for N4 Niagara Core Container Supervisor 1000 field device pack (Standard drivers included) up to 50000 points

COMPATIBILITY

In any given Niagara system, the Niagara Supervisor must be running the highest version of any Niagara instance in the architecture.

When connecting to JACEs that are running older versions of Niagara, these compatibility guidelines apply:

- **Niagara AX:** Niagara 4 Supervisors can connect to JACEs running Niagara AX versions 3.8 and higher.
- **R2:** Niagara 4 Supervisors can connect to JACEs running R2 through the oBIX XML interface only.

PLATFORM REQUIREMENTS FOR NIAGARA SUPERVISOR

Niagara 4 Supervisors may run acceptably on lower-rated platforms, or may even require more powerful platforms, depending on the application, number of data points integrated, data poll rate, trend collection rate, number of concurrent users,performance expectations, etc.

- **Processor:** Intel® Xeon® CPU E5-2640 x64 (or better), compatible with dual- and quad-core processors
- **Operating System:** Windows 11 and 10 Pro x64-bit; Windows Server 2022 and 2019; Linux x64-bit: RedHat Enterprise Linux 8.7, Ubuntu 22.04
- **Browser:** Chrome, Firefox, Microsoft Edge
- **Mobile Browser:** Safari on iOS, Chrome on Android
- **Relational Database (optional):** MS SQL Server 2019, 2016; Oracle 19c; MySQL 8.0
- **Memory:** 6 GB minimum, 8 GB or more recommended for larger systems
- **Hard Drive:** 4 GB minimum, more recommended depending on archiving requirements
- **Display:** Video card and monitor capable of displaying 1024 x 768 pixel resolution, 1080p (1920 x 1080) minimum resolution recommended
- **Network Support:** Ethernet adapter (10/100/1000 Mb with RJ-45 connector)
- **Container Engine** (for Containerized Supervisors): Docker

TRIDIUM

tridium.com

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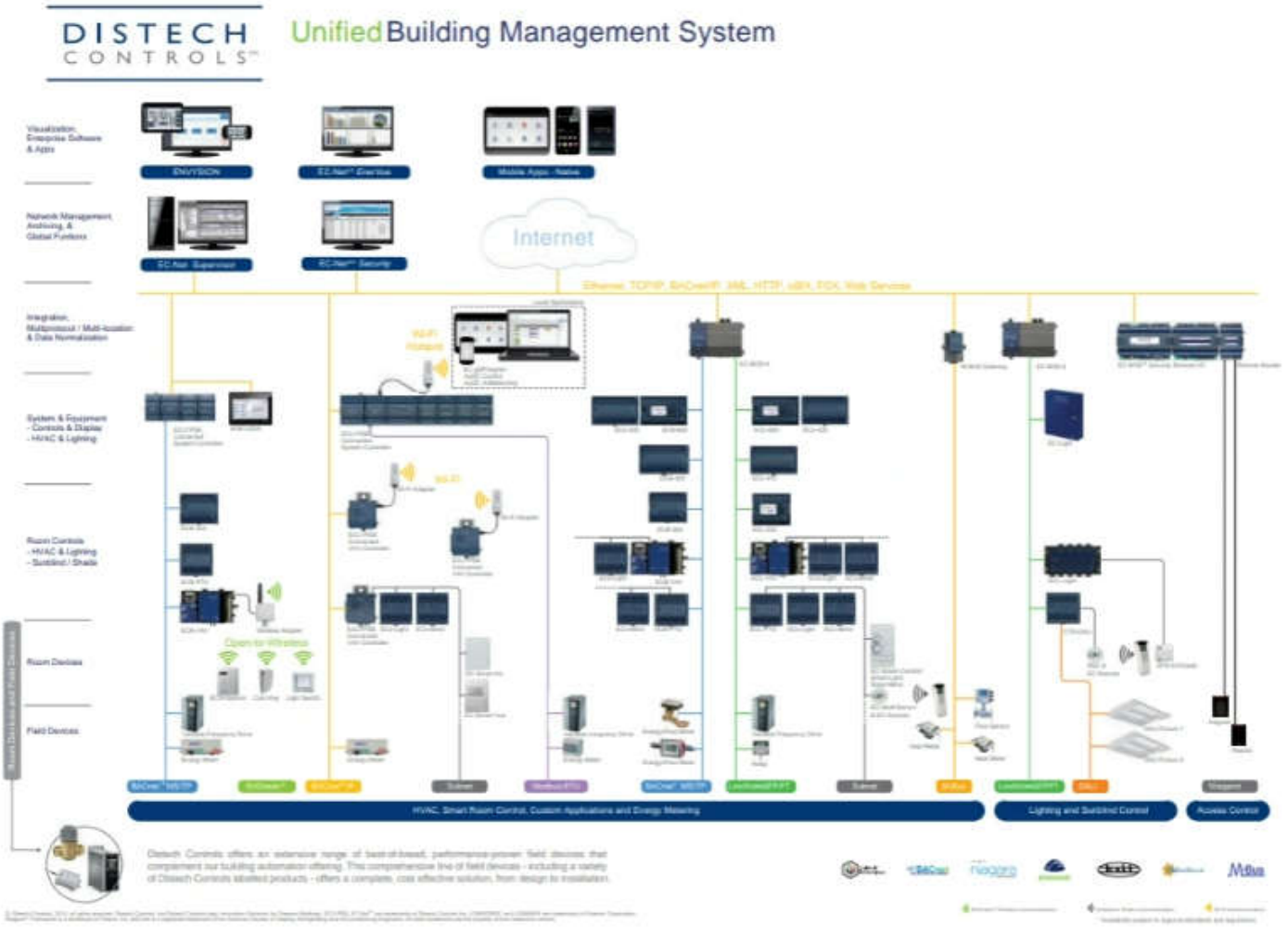
86 400 818 6088

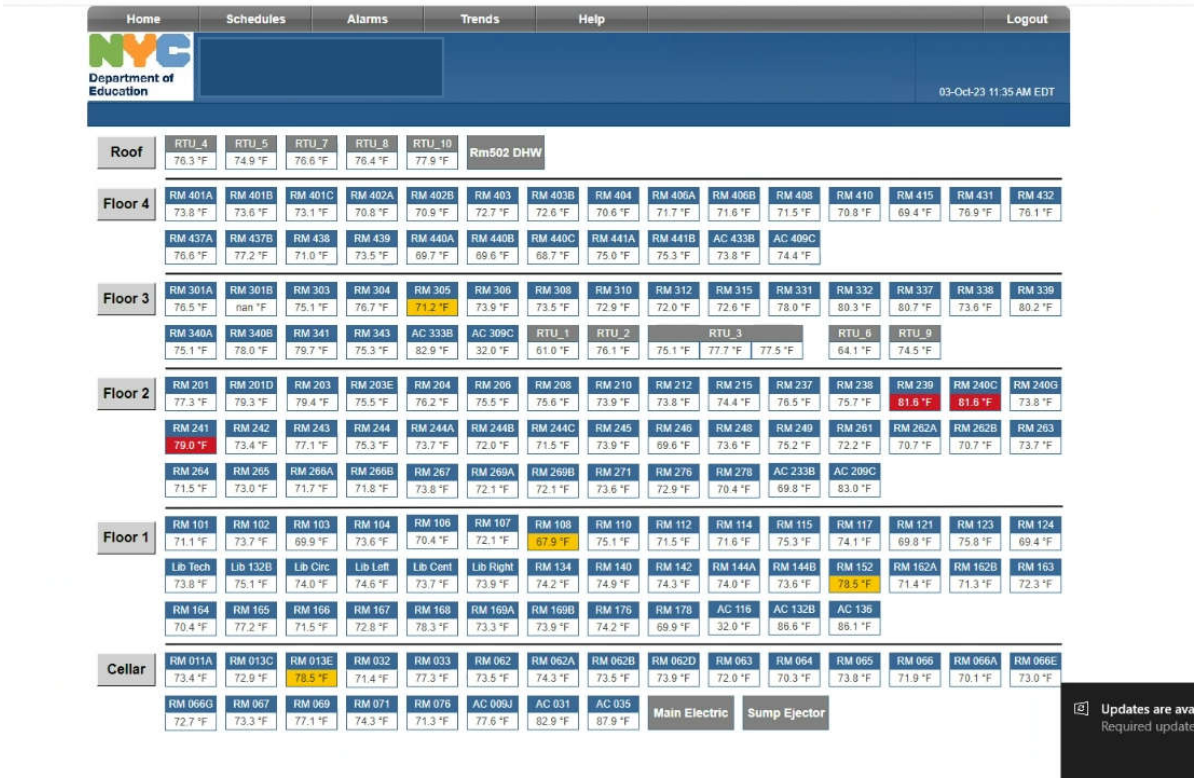
2023-0015

Outline of BMS System

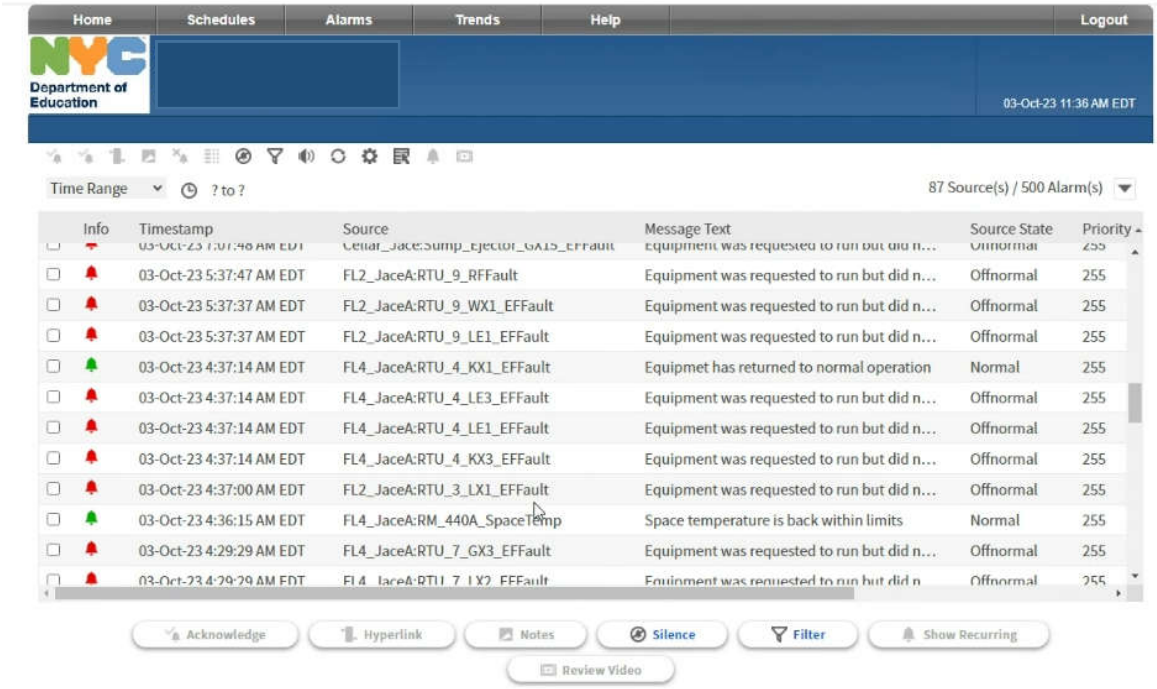
System Architecture



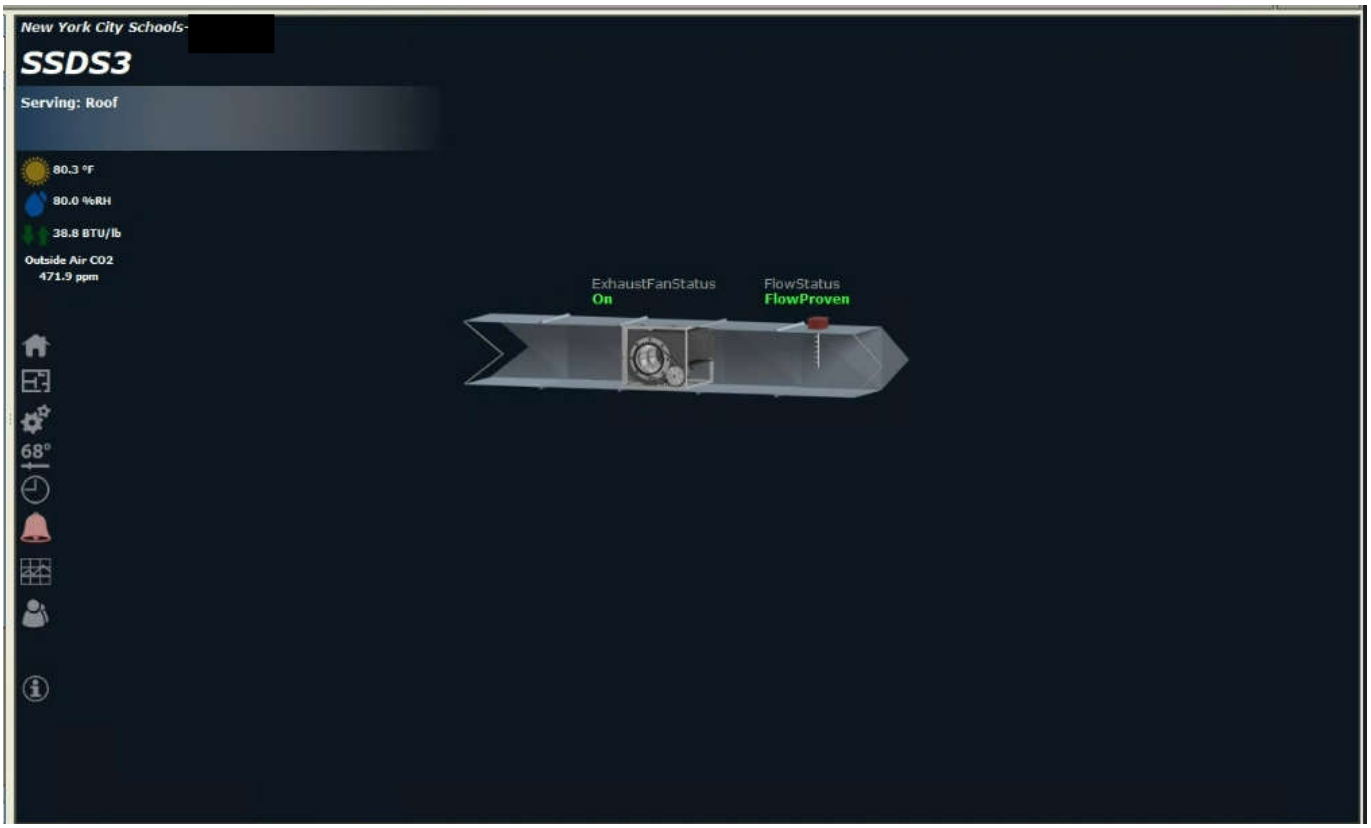
Sample BMS Home Page



Sample BMS Alarm Page



Sample SSDS Graphic



Controller

Typical DOE Equipment....pdf

ECB-600 Series & ECx-400 Series

BACnet B-AAC Programmable Controllers and I/O Extension Modules

Overview

The ECB-600 Series controllers are microprocessor-based programmable controllers designed to control various building automation applications such as air handling units, chillers, boilers, pumps, cooling towers, and central plant applications. This series supports up to two ECx-400 Series I/O extension modules.

This controller uses the BACnet® MS/TP LAN communication protocol and is BTL®-Listed as BACnet Advanced Application Controllers (B-AAC).

Applications

These controllers meet the requirements of the following applications:

- Central Plant
- Air Handling Units
- Multi-Zone Applications
- Chillers
- Boilers
- Cooling Towers
- Roof Top Units
- Power Measurement

Features & Benefits

Universal Inputs and Outputs

This controller has various software configurable universal inputs and software configurable universal outputs, and covers all medium to large-size industry-standard HVAC applications.

This series supports up to two ECx-400 Series I/O extension modules that operate off of a separate sub-bus, giving this controller a total of up to 40 universal inputs and 36 universal outputs.

Highly Accurate Universal Inputs

Highly accurate universal inputs support thermistors and resistance temperature detectors (RTDs) that range from 0 Ohms to 350,000 Ohms, as well as support for inputs requiring 0 to 10VDC or a pulse count. 0-20mA inputs and outputs have a jumper that eliminates the need for external resistors. This provides the freedom of using your preferred or engineer-specified sensors, in addition to any existing ones. The first four universal inputs support fast pulse count reading up to 50 Hz for gas, water, and electric meters and are compatible with an SO rated (optically-isolated) output.

DISTECH CONTROLS™

Innovative Solutions for Greener Buildings™

Distech Controller

Datasheet

EC-BOS-8

Multi-protocol Web Building Controller

Overview

The EC-BOS-8 is a compact, embedded controller and server platform for connecting multiple and diverse devices and sub-systems. With Internet connectivity and Webserving capability, the EC-BOS-8 controller provides integrated control, supervision, data logging, alarming, scheduling and network management. It streams data and graphical displays to a standard Web browser via an Ethernet or wireless LAN, or remotely over the Internet.

The EC-BOS-8 controller operates with EC-Net™ 4 web-based building management platform powered by the Niagara Framework®.

Applications

- Network management of field controllers and devices
- Integration of various field buses and communication protocols
- Web serving capabilities that allow remote monitoring and management of network
- Scalable licensing model and modular hardware make the EC-BOS-8 suitable for installation in small buildings, as well as large multi-unit campuses when combined with EC-Net 4 Supervisor

Features & Benefits

Hardware Platform
Optimized for EC-Net 4

- 2GB user storage can carry the load of EC-Net 4 and more user data
- 1000MHz processor with secure boot feature offers fast performance and authentication of data storage prior to station startup
- USB port offers support for station backup and restore
- Backward compatibility allows the EC-BOS-8 to run an EC-Net^{AX} station (minimum requirement is 3.8.111)

Modern Design for
Simplified Installation and Integration

- The new, modular design of the EC-BOS-8 makes it easy to install, integrate and deploy.
- Two on-board isolated RS-485 ports for connecting BACnet MS/TP and Modbus RTU devices.
- Users can easily check system status by glancing at the front panel LEDs to diagnose network issues.

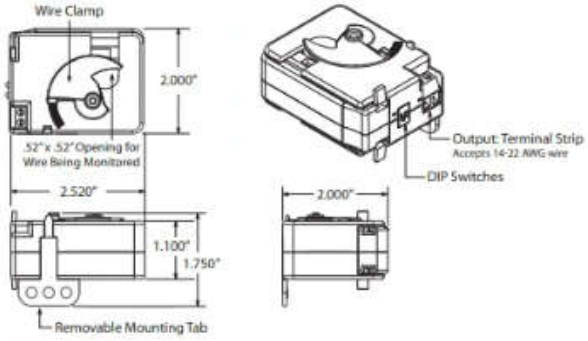
Sample Current Sensor

Functional Devices, Inc. (800) 888-5538 sales@functionaldevices.com www.functionaldevices.com

AC TRANSDUCER

RIBXGTV10

Enclosed Self-Powered Split Core Multi-Range (0-20A, 50A, or 100A) AC Transducer with 0-10Vdc Terminal Output



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Made in USA

CURRENT SENSORS

SPECIFICATIONS

Operating Temperature: -30 to 140° F
Humidity Range: 5 to 95% (noncondensing)
Accuracy: 98.8% Full Scale
Loading: RIBXGTV10, (0-20 Amp), 5% Error @ 60.4 kΩ
RIBXGTV10, (0-50 Amp), 5% Error @ 25.24 kΩ
RIBXGTV10, (0-100 Amp), 5% Error @ 13.65 kΩ

Max Sense Voltage: 600 Vac
Approvals: UL Listed, UL916, UL864, California State Fire Marshal, C-UL
Mounting/Installation: Removable mounting tab provided. The wire clamp locks against the wire being monitored, securing the unit in place.
Sensor Type: Split core with voltage output

DIP SWITCH		
1	2	Sensing Range
OFF	OFF	0-20 Amp
OFF	ON	0-50 Amp
ON	OFF	0-100 Amp