Metronet resolves HVAC back-up challenges with the **Dual*Xchange* DAC** from RF Industries

NEMA 4-rated Dual*Xchange* DAC (Direct Air Cooling) protects site operations during power outages

Co-Authors:
Sri Arunachalam, RF Industries, Director, Product Line & Applications Engineering
Pedro Yarahuan, RF Industries, Director, Key Accounts

THE CHALLENGE:

PROVIDE EFFICIENT BACKUP COOLING TO WALK-UP CABINETS TO MAINTAIN OPERATION DURING POWER OUTAGES

Metronet's walk-up cabinets (WUCs) are cooled by mechanical, door-mounted HVAC units that provide cooling and heating. During a power outage, the HVACs cease to operate. This creates an urgency to activate a backup cooling solution before the equipment inside the cabinet overheats, producing high temperatures and alarms that put customer connectivity at risk. To mitigate this risk, Metronet sought a backup cooling solution that could be utilized in lieu of the HVAC until a mobile generator restored HVAC operation.

Due to the equipment inside the cabinet and the outdoor operating environment, a solution capable of NEMA 4 rating is required to accomplish this task.

RF Industries (NYSE:RFIL) collaborated with Metronet to develop an energy-efficient backup cooling solution to extend battery backup time using an innovative environmental control platform based on Direct-Air-Cooling (DAC).

> "We've been very impressed with the performance of the NEMA 4 Dual*Xchange* DAC and the efforts to ensure it delivers maximum benefits to Metronet. We look forward to collaborating with RF Industries on additional enhancements to further extend the platform functionality and benefits."
>
> Craig Jefferson
> Facility Engineer, Metronet

THE SOLUTION:

A SECONDARY THERMAL COOLING SOLUTION THAT PROVIDES BACKUP ENVIRONMENTAL CONTROL IN THE EVENT THAT AN HVAC UNIT FAILS OR THE SITE EXPERIENCES A POWER OUTAGE

RF Industries solution implemented a Dual*Xchange* DAC to solve Metronet's requirement for secondary thermal cooling. The Dual*Xchange* DAC is a flexible DC-powered solution with NEMA 4 rating that can effortlessly take over to provide thermal cooling of the cabinet and eliminate interruptions during power outages.

To solve this problem, the Dual*Xchange* DAC is used in a hybrid ecosystem with the current HVAC. When the internal cabinet temperature is below the maximum set for the cabinet, the Dual*Xchange* DAC recirculates air within the cabinet to help maintain a uniform temperature. If the temperature rises above the threshold, the hybrid ecosystem blows fresh, cooler air into the cabinet.

Each hybrid ecosystem can deliver 1,000 cubic feet per minute of fresh air into a cabinet and can supplement environmental control for up to four HVACs. The NEMA 4 rated air intake and exhaust ensure reliable system operation and protection against water ingress.

The NEMA 4-rated DualXchange DAC features a streamlined profile.

An additional benefit is that Dual*Xchange* DACs do not require a licensed HVAC technician for maintenance.

The Dual*Xchange* DAC also includes sensors that collect HVAC temperature and electrical power usage data for use in advanced IoT and AI-based data analytics solutions. Each sensor monitors up to three HVACS and provides multiple inputs as well as an RS-232 communications port.

THE RESULTS:
METRONET PROTECTS SITES AGAINST HVAC FAILURES AND SERVICE OUTAGES

During an extensive field trial, Dual*Xchange* proved it could meet Metronet's backup power needs. Metronet has ordered its first set of Dual*Xchange* DACs for initial commercial deployments across multiple states, with eventual adoption nationwide.

NEXT STEPS:
UNLOCKING THE FULL POTENTIAL OF RF INDUSTRIES DUAL*XCHANGE* DAC

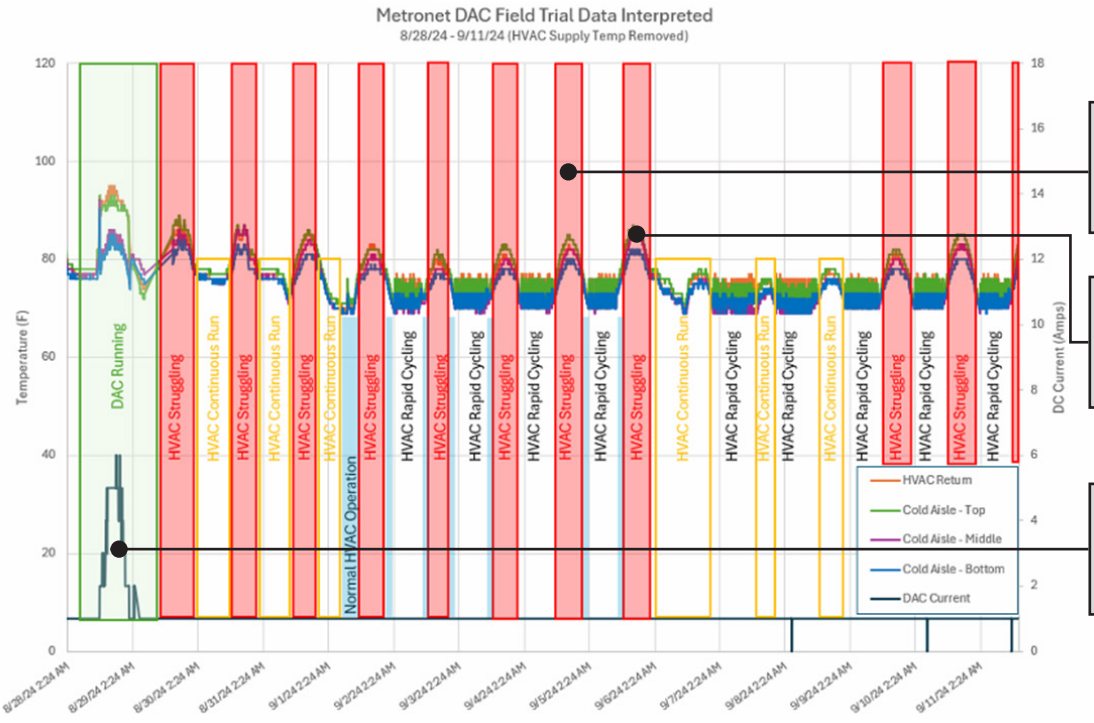
The Dual*Xchange* DAC platform has the capability to unlock considerable savings in:

- Reduced OPEX related to lower site power consumption
- Reduced site visits by increasing lifespan of HVACs
- Predictive Maintenance to avoid costly repairs

When Dual*Xchange* DAC is set up as a primary thermal cooling solution with HVACs as a backup, there is a potential to reduce the energy consumption by 90%. These significant energy savings are achievable because the Dual*Xchange* hybrid ecosystem only requires 250 watts of power, compared to the 1.5 kilowatts needed for a traditional HVAC unit. Furthermore, only one Dual*Xchange* unit is necessary for a walk-up cabinet that currently uses four HVAC units. With the Dual*Xchange* DAC in operation primarily versus traditional HVAC, the energy savings are significantly higher.

As an added benefit of this configuration, the HVAC unit(s) operate less frequently and for shorter durations, thereby greatly improving the lifespan and reliability of the HVAC. Near residential areas, this reduces nuisance compressor and fan noise. This leads to a significant decrease in the need for expensive site visits and replacement parts, minimizing the likelihood of costly early replacements of the HVAC unit(s).

As part of the trial, RF Industries Dual*Xchange* DAC's sensor and monitoring solution collected information about the operational behavior and thermal dynamics of the site. Below is an example dataset captured during the trial by the DAC controller, which provides key insights into environmental conditions, HVAC and DAC behavior, and power consumption.



The RF Industries sensors' temperature and power current data would ensure that advanced data analytics solutions make accurate recommendations for predictive maintenance, automation, and other site optimizations. And if the local power grid fails, Metronet already has a backup environmental control system in place to ensure that customers don't experience internet service outages.

Both companies are currently assessing the use of Dual*Xchange* to improve operational efficiencies.

Sensors enable real-time site monitoring and data collection allowing users to make informed decisions that reduce energy consumption and save money.

Changing filters has never been easier with RF Industries Direct Air Cooling ecosystems.

RF INDUSTRIES' DAC SYSTEMS ARE WIDELY PROVEN TO BE RELIABLE AND COST-EFFECTIVE

Thousands of RF Industries DAC environmental ecosystems are already providing automated thermal management in telecom shelters, cabinets and edge data centers nationwide. Carriers choose the next-gen, made-in-the-USA systems because they use fresh, filtered air and variable-speed fans to reliably control airflow and temperature in a far more energy-efficient and environmentally friendly way than traditional HVAC systems.

METRONET

METRONET: PCMAG'S "FASTEST MAJOR ISP FOR 2024"

Metronet is one of the largest independently owned fiber internet service providers in the U.S., delivering multi-gigabit internet services to homes and business in more than 300 communities across 17 states. In addition to super-fast speeds, Metronet fiber networks are known for their carrier-class resilience and uptime, thanks to network architectures based on multiple fiber rings that provide a level of redundancy not often seen from fiber-to-the-home (FTTH) providers.

ABOUT RF INDUSTRIES

RF Industries designs and manufactures a broad range of interconnect products across diversified, growing markets including wireless/wireline telecom, data communications and industrial. Our products include RF connectors, coaxial cables, data cables, wire harnesses, fiber optic cables, custom cabling, energy-efficient cooling systems and integrated small cell enclosures.

Our high-touch customer approach allows us to be responsive, accessible and hands-on when needed, every step of the way. Unlike large organizations, you will always be our number one priority. Our end-to-end support promises personal attention, guidance, and partnership all the way through site deployment.

RFI's unique flexibility also gives us a competitive advantage. As an agile business, we are able to identify and react to challenges quickly and easily, resulting in a smoother overall customer experience.