HONEYWELL SUCCESS STORY

Combining detection capabilities of the Honeywell Transmission Risk Air Monitor with the power of Niagara Operating System to support healthy buildings.

The global pandemic brought the importance of indoor air quality to the forefront, highlighting how the air we breathe can affect our health and cognitive function. Research conducted by scientists at the University of Colorado[1,2] demonstrated the results of real-time monitoring of indoor ambient air can be useful as an indicator of increased risk of airborne viral transmission, based on varying levels of risk-based factors such as CO_2 concentration levels and the type of human activity in the area.[1]

Honeywell recognized the importance of this research. With an intent to create a forward-thinking environment for employees through construction of a green building, Honeywell combined two of their own products in the design of the new corporate headquarters in Charlotte, North Carolina.

BACKGROUND

The Honeywell Transmission Risk Air Monitor alerts users when conditions are present that may increase the risk of potential exposure to airborne viral transmission in an indoor area. The wireless, portable Honeywell Transmission Risk Air Monitor (HTRAM) measures carbon dioxide and features a proprietary risk alerting system based on activity levels within a room. Pre-programmed indoor activity settings offer guides for air quality monitoring: low activity (movie theaters, libraries, classrooms), medium activity (restaurants, offices, small clinics), and high activity (gyms, indoor arenas, recreation centers) and is recommended for coverage of 800-1000 square feet.

For each setting, the monitor provides indications using a traffic light pattern (green, yellow, or red) and a sound alarm to alert occupants about air quality conditions based on detectable CO_2 levels. End users may then act to proactively improve indoor ventilation. Custom settings may also be incorporated.

Niagara, developed by Honeywell Building Technologies, was deployed as the building management system to coordinate processes and functions. The modern, user-friendly platform/display uses HTML5 to provide an array of rich features. The powerful framework results in a simpler and more robust user experience while offering enhanced control of data and decisions. From buildings and data centers to manufacturing systems and smart cities, the Niagara Framework facilitates improved decision-making, allowing for optimized performance and cost reductions that can help businesses become both more competitive and profitable.

REAL WORLD APPLICATION

When Honeywell's headquarters moved to Charlotte, the company's leadership envisioned an energy-efficient building that would also promote health for employees and guests. Schedule-based operation of the HVAC system was among the green design features implemented for the building, rather than allowing the system to run continuously. Each weekday at 6:00 p.m., the HVAC system shuts down. Any events after 6:00 p.m. require workflow creation for the building management system to allow HVAC in a certain building zone.

Honeywell

HEALTHY BUILDING SOLUTIONS

Integrating the air monitor with the Niagara framework was "seamless and relatively easy," explained Honeywell engineers. They installed two air monitors in the big boardroom. Based on room size and occupancy levels, one device was installed on a pillar and the other one was placed on the conference room table. Installation and integration were very straightforward, completed in a few steps.

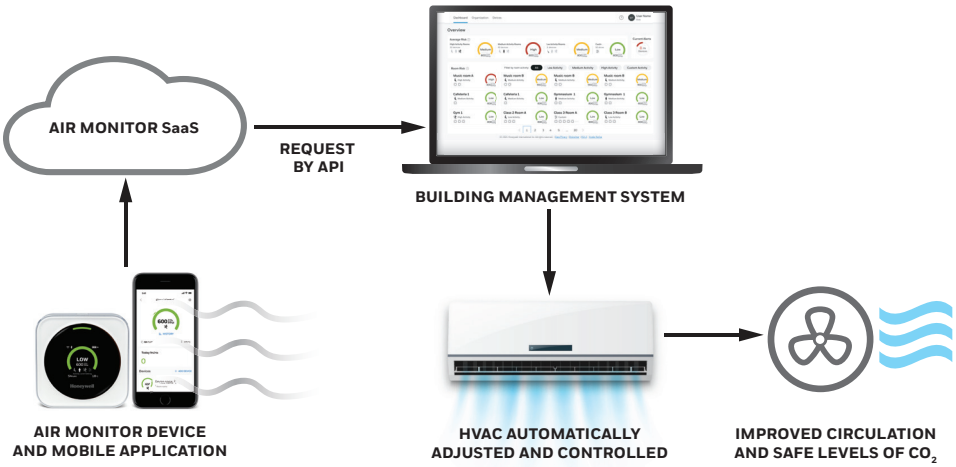
1. Power on air monitor devices and connect them to the Honeywell Enterprise Network (initial IT coordination required)
2. Air monitor data transmission through API (device data ➔ air monitor cloud server ➔ Niagara ➔ BMS control system)
3. High alarm reading on air monitor triggers on-demand ventilation

Benefit of Integration with Building Management System/Control via REST API for a "closed loop" HVAC automation

Real-time air monitor data is pushed to the cloud server. Using API, Niagara calls in data from air monitor cloud server to communicate with the Building Management System (BMS). Data flows to the control center into the BMS dashboard. The system is configured to take action in response to the air monitor's alarm threshold, increasing ventilation through HVAC operation and dampers to bring in fresh air. With HTRAM and Niagara connected, the real-time readings for CO_2, temperature, and humidity, along with room name and alarm status, were requested and acted upon automatically.

Customized on-demand ventilation and HVAC automation has significantly improved from the traditional scheduled method by:

1. Energy efficiency: this could potentially decrease energy bill from running HVAC 24/7 or scheduled hours and also maintain the equipment usage life
2. Reduction of delayed facility maintenance response
3. Peace of mind with noticeable ventilation change in real time



Through API, the HTRAM has the integration capability with other types of BMS systems, not limited to Honeywell's Niagara and BMS system.

HTRAM & NIAGARA IN ACTION

Shortly after the implementation, Honeywell hosted an evening meeting at 8 p.m. with 17 guests in the conference room. The monitor showed a red light – signifying a high level of CO_2 in the room based on the activity level. Simultaneously, an audio alarm sounded in the room and CO_2 data was sent to the BMS (requiring approximately one minute to reach the Niagara system), which turned on the HVAC and provided an influx of fresh air. In addition, two meeting participants noticed the visual red indicator and immediately opened the terrace door to let fresh air into the conference room. In under six minutes, the air monitor progressed from a red condition, to yellow, and eventually to a green status.

CONCLUSION

Enterprise solutions for today's connected buildings seamlessly integrate Honeywell air monitors with Niagara and Healthy Building dashboard. Whenever air quality declines, the HVAC system instructs the damper to bring in more fresh air and to improve circulation, quickly decreasing CO_2 and particulate levels. Combining these proven technologies has created confidence in both the products and combined solution. After this successful integration, Honeywell plans to install devices in their Atlanta and India regional offices.

For more information

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**** The Honeywell Transmission Risk Air Monitor (HTRAM) analyzes specific air quality conditions and alerts the user when conditions are present that may increase risk of potential exposure to airborne viral transmission. It does not prevent or reduce virus transmission nor mitigate viruses that may be present, nor does it detect or warn against the presence of any virus, including but not limited to COVID-19. Even at lower risk levels caution is required to prevent viral transmission. The HTRAM does not repel or destroy any microorganism, viruses, bacteria, or germs.***

[1] COVID-19 Airborne Transmission Tool Available | CIRES (colorado.edu)

[2] Exhaled CO_2 as COVID-19 infection risk proxy for different indoor environments and activities, Sept. 2020, https://www.medrxiv.org/content/10.1101/2020.09.09.20191676v1

THE FUTURE IS WHAT WE MAKE IT

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