

ADRES Automated Demand Response and Energy Savings
**BUILDING AUTOMATION SYSTEM
INFORMATION RESPONSE**

**ENGINEERING DEPARTMENT
SPECIFICATIONS
ADVANTAGES AND CONSIDERATIONS**

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Engineering Department Considerations

Recommended ADRES deployment is one ADRES controller for each HVAC Unit. ADRES controller to be installed at the factory interfaced to standard thermostat controls with the addition of advanced modulating economizer control and variable frequency drive (VFD) Indoor fan control including all sensors.

Alternatively, the ADRES can be installed in its NEMA 4X enclosure on the exterior of the HVAC unit and wired into the standard Thermostat interface as above. Exterior mounting and installation provides easy access by maintenance personnel to check the operating status of HVAC unit using the status lights on the ADRES controller.

Each ADRES Controller includes an embedded cellular modem with a private IP address which transmits all encrypted data to the cellular carrier then passes the segmented data traffic through an IPSEC VPN tunnel to the ADRESpro servers. All servers, switches and other network devices are included in the ADRES first cost setup.

The ADRES Controller system with six HVAC units per store would cost \$20k to \$40k less than a BACNET hardwired Ethernet system. The ADRES Controller does not require the conduit or Ethernet cable that would be run to each of the six HVAC BACnet controllers. The ADRES Controller also does not run on the corporate IT network and is not dependent on the local LAN or local ISP. Additional ADRES controls are available and preconfigured to interface and control renewable technologies and systems that might be added in the future including lighting control, solar PV, battery storage, wind turbines, backup generators, etc.

Each ADRES Controller includes an on-board measurement and verification reporting capability that that can be used for approved Utility rebate and incentives programs.

ADRES system hardware and software features:

- ADRES Controller hardware and point list capability (see page x).
- ADRES Controller can be installed in HVAC unit at the factory.
- ADRES Controller can eliminate BACnet or hardwired server (s), controller (s), conduit, and Ethernet runs to the HVAC units, lighting controls, etc.
- ADRES Controller can be retrofit to existing HVAC equipment in an externally mounted NEMA enclosure and either Thermostat Interface or even BACnet controlled HVAC unit.
- ADRES Controller provides all advanced capabilities and functionality of a hardwired BACnet controller with the addition of on-board memory of performance data.
- Each ADRES Controller is setup to automatically forward performance, sub meter, control settings, set points, etc. every 15 minutes to the ADRES Servers. The elimination of having to “poll” each BACnet unit results in improved network efficiency and eliminates a single point of failure within each building.
- The ADRES Controller has a built-in over-the-air firmware update utility to allow for changes in firmware to be executed without deployment of HVAC personnel on-site.
- The ADRES Controller will record and store performance data in 15 minute increments in its on board memory for more than 1 year.

- The ADRES Controller has the ability to be hardwired via Ethernet or RS485 connection to local equipment if the Cellular option is not chosen or if the ADRES Controller is needed to interface with other technologies.

ADRES Control Series

Control System Solution

Summary of Features and Options

• Feature □ Option

HVAC Systems

- Single to four-stage gas/electric
- Single to four-stage heat pumps
- O or B type reversing valves
- Emergency heat control
- Electric strip heaters
- Modulating economizer control
- Single or two-stage heat
- Ventilation control
- Humidifier control
- De-humidifier control

Sensors

- Room or space temperature
- Supply air temperature
- Outdoor air temperature
- Indoor humidity
- Outdoor or supply air humidity
- Supply air pressure
- Air quality

Auxiliary Inputs

- Warmer and cooler keys
- Electric meter kWh
- DSM command control

Heating and Cooling Selections

- Heating only
- Cooling only
- Automatic heat/cool changeover
- Heat and cool off
- Emergency heat (heat pump)

Heating and Cooling Modes

- Manual operation
- Program operation
- Override operation
- Vacation economy mode

Indoor Fan Operation

- Automatic
- Continuous
- Timed continuous
- Duty cycle operation
- Fresh air mode
- VFD indoor fan control

Comfort Enhancements

- Programmable time/temperatures
- Programmable On to Off heating temperature range
- Programmable On to Off cooling temperature range
- Alarm when temperatures exceed preset limits
- Warmer and cooler keys at each space sensor for occupant limited override

System Communication and Control

- Modbus communication interface to one or more devices and systems for monitoring, control and alarming.
- BACnet communication interface to one or more devices and systems for monitoring, control and alarming.
- OpenADR demand response capable
- Web Browser monitoring and control using PC Computer, smart phone, etc.
- Local control using Web Browser.

Energy Savings

- Programmed time/temperature
- Vacation mode
- Timed fan operation
- Advanced Digital Economizer control
- Intelligent fresh air mode
- Limit 2-stage heating in moderate weather
- Execute supply air reset during moderate demands
- Alarm feature detects poor equipment performance
- Limit unauthorized changes to setpoint
- Limit setpoint change using Warmer and Cooler keys
- Built in Measurement & Verification.
- Adjust setpoint temperature during high KW demand
- Monitor energy usage and detect heavy or unusual usage.
- Monitor nighttime or overtime HVAC usage