

Specification for Building Diagnostics and Analysis System (BDAS):

1. A Building Diagnostics and Analysis System (BDAS) shall be installed to utilize data from the Building Automation System (BAS) . This system shall be Continual-Eyes™ by Energrene Tech Inc., or approved equal. The BDAS system shall actively analyze all available BAS unitary and programmable control unit programs.
 - a) Examples of Diagnostics and Analysis shall consist of:
 - Analysis of all PID loops.
 - Analysis of control loops. (Ex: VAV overflow, underflow, etc.).
 - Analysis of sequencing and rotational loads.
 - Analysis of setpoint reset applications.
 - Detection of controlled device malfunction. (Ex: Heat Valve not closing).
 - Detection of common program oversight. (Ex: Simultaneous heat/cool).
 - Indication of excessive continuous runtime (Signaling an overridden condition).
 - Recommendations for more efficient operation. (Ex: Disable economizer minimum position operation in unoccupied mode).
2. System integrity:
 - a) The BDAS shall utilize logic and algorithms independent from the BAS controllers.
 - b) The logic and algorithms shall consist of protected and compiled programming to maintain the integrity of it's intended function.
 - c) Certain parameters shall be made adjustable for proper system analysis. (With proper user permissions).
 - d) The BDAS shall be have the option of operating transparently to the BAS system. In this configuration, the BDAS shall be completely independent and hidden from all BAS operator functions.
3. Connectivity:
 - a) Stand-alone operation.
 - In stand-alone applications, the BDAS shall include the necessary hardware and software for all functionality described herein.
 - The BDAS shall import live data from the BAS system using common communication protocols.
 - All BDAS logic and algorithms shall be implemented on the BDAS platform.
 - The BDAS shall have the capability to export alerts to the BAS utilizing BACnet®, LONWORKS® or Modbus®. The BAS shall only have the capability to monitor the BDAS alerts.
 - b) Add-on to BAS system.
 - As an add-on to the BAS system, the BDAS shall share the same hardware platform as the BAS system.
 - The BDAS analysis logic and algorithms shall utilize compiled programming and code independent from the BAS system standard program tools and objects.
 - The use of the BAS system's standard programming tools, program blocks or function blocks are not acceptable for use in the BDAS analysis logic and algorithms.
4. Program execution.
 - a) The BDAS shall have the ability to continuously and simultaneously analyze all systems

utilizing live data to ensure synchronization of system variables.

5. Logging:

- a) The BDAS shall maintain a history of alerts.
- b) The BDAS shall log all modifications to parameters. Each log entry shall display:
 - Timestamp
 - Name of parameter that was changed.
 - The previous value of the parameter.
 - The new value of the parameter.
 - The username of the operator that changed the parameter.

6. The BDAS shall have a WEB based interface including.

- a) Dynamic console display of all active and unacknowledged alerts.
 - Console display shall categorize the primary concern of each alert as follows:
 - Maintenance issue.
 - Potential harm or wear to equipment.
 - Financial impact.
 - Indication of energy waste or other financial impact.
 - Comfort
 - Indication of potential comfort related issue.
 - The dynamic console display shall include a hyperlink function on every alert that will lead the operator to the affected system.
- b) Graphical display of systems.
 - Alerts may be exported or integrated into the BAS system for display on the existing BAS graphics or may be stand-alone.
 - Graphics alerts:
 - Whether stand-alone or integrated into the BAS, the BDAS shall have graphics alert icons pre-configured for display near the affected components or systems.
 - The graphics alert icon shall blink and display only when that specific alert is active.
 - This graphics alert icon shall lead the operator to a text based pop-up screen.
 - The pop-up screen will display the following information:
 - Reason for alert. (Why this graphics alert was generated).
 - Reasons for concern. (Energy, comfort or maintenance and any other details).
 - Checklist for resolution.
 - The BDAS shall provide for modification of the pop-up screen text to fit operation procedures. (With proper operator permissions).
- c) Operator Levels:
 - The administrator shall have the ability to set read, write and view permissions individually or to groups of operators.
- d) The BDAS shall have the ability to configure, display and email custom reports.

7. System Templates

- a) The BDAS shall have templates for common systems.
 - Installer shall be able to modify the template to match the system without changing any internal BDAS programming.

- These templates shall include:
 - Graphic icons for implementation on system graphics.
 - Configuration tools or displays for selecting options or system parameters.
 - Pre-built system alert pop-up screens and text.
 - Protected and compiled programming specific to the intended system.
- At a minimum, the BDAS shall have templates for the following:
 - VAV Boxes, Rooftop Units, Fan Coil Units, Heat Pumps, Constant Volume AHU's, Variable Volume AHU's, Heating Water Systems, Chilled Water Systems and Energy Recovery Units.