

Custom Structures Eco-House



*Innovative Electronic Systems (IES)
Installation Case Study using ELK M1 Control*

Eco-House is a LEED Gold rated home utilizing energy efficient systems, smart home controllability and environmentally conscience construction principles.

What event started this project?

Innovative Electronic Systems (IES), a leading electronic systems contractor in Hurt, VA partnered with Custom Structures, Central Virginia's leading architectural design and build firm, to build the 1st LEED certified home in the Central Virginia area. This residence, called the Eco-House, was intended to be a model home to educate the public regarding new energy efficient systems and "Green" principles, products and services that are locally available.

Lynchburg's first Eco-House needed to conserve energy and water, contribute less waste to landfills and reduce harmful greenhouse emissions. In addition, the Eco-House needed to provide a healthier and safer environment for its occupants and demonstrate a commitment to environmental stewardship.



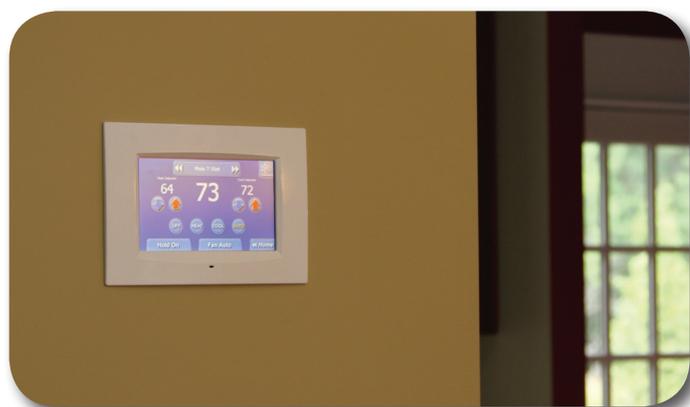
How did Elk's M1 Control and other products play a role in the Eco-House?

According to Jeremy Shelton, President of IES, "We selected Elk Products M1 control as the "brains" of the home. We needed to control the home security system, the full HVAC system including radiant floor heating and ceiling fans, lighting and flood protection. Elk's M1 was selected as the cross platform control because it is a robust system that offered the flexibility and scalability we needed for this project." The following outlines the systems installed and some specifics surrounding the components:

Security

M1 rules were set so that when the system was armed, the garage doors would automatically close. The panel is also set so that when the security system is armed, the temperature is adjusted appropriately for night or away.

- *Fourteen (14) wireless window contacts*
- *Two (2) wireless recessed door contacts*
- *Two (2) garage door contacts*



- *One (1) AprilAire 8870 thermostat*
- *Four (4) Elk zone temperature sensors*

Climate Control

Elk zone temperature sensors located in each bedroom were used to monitor temperature in each room. When the temperature of any room goes out of acceptable range, the zone temperature sensors alert the M1. The M1 takes action by energizing a relay that activates the appropriate pumps or fans of the heating or cooling system. For cooling, the M1 was programmed to utilize the three ceiling fans as the 1st stage of mechanical cooling (controlled by UPB switches). Second stage cooling is performed by a reverse chiller controlled via the AprilAire thermostat and Elk relay board. For heating, the M1 activates pumps that deliver hot water through the hydronic radiant floor heating system. IES wrote rules for the M1 to make these actions occur.

“...M1 enabled us to do everything the builder wanted us to do. The system was very intuitive...”



Lighting Control

The M1 turns off all lighting when armed in “Away” mode. Sensors were installed in closets to operate the lights when the doors are opened and closed.

- Three (3) 600w UPB switches to control ceiling fans in bedrooms
- Three (3) 600w UPB switches to control lights in bedrooms
- Three (3) 1000w UPB switches to control outdoor lights
- Four (4) remote 3-way switches

Flood Control

Water sensors were installed in strategic locations where leaks are likely to occur. When a sensor is violated the water is automatically turned off. Also, the M1 sends a text message to alert the homeowner when a water sensor is violated. Flood control also helps reduce wasteful water usage.

Location of water sensors for leak detection:

- Two (2) toilets
- One (1) ice maker
- One (1) washing machine

Why did you select Elk Products for this application?

Says Shelton, “We chose M1 because of its exceptional rules capability and ease of programming. We found the M1 enabled us to do everything the builder wanted us to do. The system was very intuitive and subsystems could do specific things we needed.” Shelton continued, “We took product training classes at Elk’s headquarters and found their trainers to be very knowledgeable and helpful.”

What was the result of this project?

The Eco-House was the first model home for the Lynchburg Green Building Initiative. This 1710 square foot home was constructed with such features as hydronic radiant flooring, R-50 insulation, a reverse chiller system, 18 SEER heat pump, energy star rated lighting and plumbing fixtures, complete roof runoff water storage, proper building orientation to collect solar gain, pest control alternatives, local wood materials, mold resistant and locally harvested framing lumber, low VOC materials such as carpet, painting and adhesives, indoor air purification, carbon monoxide and radon prevention methods, smart house controllability and monitoring of systems for maximum efficiency, instant hot water system and 2x6 perimeter framing to name a few.

The house attained a LEED Gold status as part of the United States Green Building Council. As part of the project, Lynchburg Green Building Initiative hosted a Green Building Expo. Attendees were directed to the Eco-House. Small portions of construction were left open to public viewing so that visitors could better understand why this house was LEED certified and energy efficient.

The benefit to the homeowners, aside from being environmentally conscious citizens, is that their winter power bills have been as low as \$30 a month. This is especially notable considering the location and the size of the home. The homeowner is currently using his smartphone with the ElkDriod app to remotely arm and disarm his system, open and close his garage door and adjust temperature in the house.



For additional details on this installation please visit www.elkproducts.com/eco-house

M1 Security & Automation Controls

M1 Gold makes security & automation control easy, flexible, scalable, and affordable. It is a robust solution for security, energy management, lighting, access control, sprinklers, water valves, audio/video, gates, garage doors, spas and more. Control everything from easy to use interfaces: keypads, telephone, pc software, internet browser and smart devices. M1 provides detection and reporting of intrusion, fire & carbon monoxide, water leaks, medical emergencies, critical temperature levels, children arriving home from school, etc. Hard wired & wireless solutions conform to any type construction. Event notification is provided off site via phone or email.



Control costs and go "Green" without compromising comfort. Shrink your carbon footprint and lower utility bills with convenient control and scheduling capabilities of lighting, climate control, shades/blinds, electric water heaters and other electrical devices. Our integration with over 40 other manufacturers provides a comprehensive, yet easy-to use system for total control of home or business with the flexibility to build a personalized system for any one at any stage of life.

ELK M1 Components used in this application:

Qty	Part Number	Description
1	ELK-M1GKS	M1 Gold Control Kit with M1KP2 Keypad
1	ELK-SWB28	28" Structured Wiring Enclosure
1	ELK-M1XRF2x	M1 Wireless Receiver
1	ELK-M1XEP	M1 Ethernet Interface
1	ELK-950	AC & Telephone Line Surge Suppressor
1	ELK-TS071	7" Touchscreen
1	ELK-M1KP2	M1 LCD Keypad
3	ELK-M1XSP	M1 Lighting/Thermostat/Serial Interface
1	ELK-M1RB	M1 Relay Board
1	ELK-M1XOVR	M1 Output Expander, 8 Voltage, 8 Relays
1	ELK-M1XIN	M1 16 Zone Input Expander
3	ELK-M1ZTS	M1 Zone Temperature Sensor with Short Probe
1	ELK-M1ZTSR	M1 Zone Temperature Sensor with 7" Probe
1	ELK-RMDESIGNER	Software for customizing graphics of ElkRMS Software (touchscreen software)

Also Used:

Android smartphone and ElkDroid App (available through Android Marketplace)



About Innovative Electronic Systems:

Innovative Electronic Systems is a locally owned business. They provide Access Control, Surveillance Systems, PC Networks, Structured Wiring, Home Theater, Climate Control, Distributed Audio & Intercom, Lighting Control, Gate Control, and Telephone Systems. They pride themselves in making their customer's experience a very easy and pleasurable one.



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