



Product Development Specification

FireAway Advantage-Lithium Panel

October 29, 2018 Rev A

Specification Revision History

Rev	Date Released	Paragraph	Description
A	10/29/18		Document Preliminary Product Features
A1	2/19/19	All	Revise to new enclosure;post UL submittal
A2	3/06/19	All	Clean up a variety of spec areas
A3	3/20/19	11	Added programming note during acuation disable
A4	7/12/19		Add QR code logic, Detection Zoning logic, etc

Product Specification Development Notes:

- Portions of this specification are extracted from UL/ULC 864¹, FM 3010², EN54-2³ and EN12094⁴.
- This product is intended for use with Linear Actuator or Aerosol Generator types of disposable devices
- Changes to this product design family include design per RoHS, WEEE and *IPC class 3*
- I've added a section for formalized software testing. I'm not too familiar with this comprehensive process but suggest we formalize a documented test checklist

Product Development Specification

FireAway Battery Panel

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1) FireAway Advantage-Lithium Control Panel Basic Features

- FireAway Advantage-Lithium Control Panel to be listed as Local Releasing Panel listed for use only with FireAway aerosol generators or similar devices
- FireAway Advantage-Lithium product development program based on previous battery powered control panel design and approval experience
- Primary and Secondary power to be supplied by non rechargeable, lithium thionyl chloride batteries (LiSOCl₂)
- Field wiring supervised circuits to include:
 - Three class B detection circuits including one manual input each with end of line assemblies
 - Class B End of Line devices to be 470k ohm resistors
 - Two releasing circuits capable of actuating (6) Stat-X matches per circuit
 - Pressure switch input
 - NC under pressure
 - Trouble if Open
 - Detection zone to Actuation zone mapping
 - (1) Any detection discharges both actuation zones
 - (a) Default = either detection zone will actuate both actuation zones
 - (2) Individual detection/release
 - (a) each detection zone mapped to individual actuation zones
 - (3) Cross zoned
 - (a) requires both detection zones to be in alarm prior to discharge,
 - (b) manual release requires no cross zoning)
 - Dedicated manual release zone will actuate both releasing zones
 - Zero to 60 second programmable time delays for actuation circuit
 - Default = zero
- Input-Output Relays used for control of external devices
 - Mapped to detection or actuation circuitry
 - Maximum ½ amp @ 30 vdc switching capability
 - Allows for remote, supervised monitoring of control panel status for Trouble and Fire conditions by a fire alarm control panel
 - Allows for logic switch to auxiliary relays
- Front panel controls accessed via locking hinged door
- Front panel controls to include:
 - Alarm Silence with corresponding LED
 - System Test (logo button)
 - System Reset button
 - Clears latched Alarm Condition
 - Provides reset to latched output relays
 - Battery Disable toggle switch
 - System Disable
 - Extends battery life while system is disabled
 - Actuation Disable switch

- Modified Trouble annunciation for power conservation
 - Per NFPA 2010:2015 sect. 6.4.6.1
- Audible alarm located on front exterior of access door
 - Enclosure to be polymeric IP65/NEMA 4X or equal sealed, hinged with keylock access
 - Internal real time clock programmed at final inspection to Eastern Standard Time and to include time and date stamped Event Log
 - Control panel programming/upload/download access port
 - Micro circular connector with dust cap
 - Allows for control panel programming, monitoring and event downloading
 - Allows for firmware boot loading

2) Product Overview

The purpose of this specification is to describe an automatic, lithium battery powered fire suppression control panel designed to operate up to twelve FireAway Aerosol Generators in series on two separate actuation zones. Three class B detection zones are provided. Control panel electronics will be housed in a non-metallic, polymeric enclosure rated to IP65/NEMA 4X minimum. Access to the pluggable field wiring connections and front panel controls is via a hinged locking cover. Primary and secondary power to the electronics is supplied via supervised Lithium Thionyl Chloride battery packs. Power limited, field wiring consists of (3) class B detection inputs, (2) actuation circuits and a single NC pressure switch circuit. Actuation circuits include programmable time delays from zero to 60 seconds in five second increments. The control panel is designed where applicable to meet UL864, FM 3010 , ULC, EN54-2, EN12094 requirements. (Actual design characteristics t.b.d. based on test agency listing review)

Power Input

Power to the control panel and its field wiring is provided by two separate battery packs designated as primary and backup power. Both power sources are supervised for presence, voltage and capacity. Expected operating life of each battery pack operating under normal conditions is 1 year assuming no Fire or Trouble conditions have occurred. Battery packs must be replaced if either non-normal condition occurs. After a 1 year time period, the primary pack must be replaced. The secondary battery may then be transferred to the primary position. Expected shelf life for the battery pack is 10 years. A label is provided which is used to indicate the installation and expiration of the each battery pack. This label is installed at the time of system commissioning and during maintenance. The battery packs are DOT tested and rated.

Detection Circuits (Initiating)

Default detection/Actuation mapping default setting is such that any detection input will actuate all actuation outputs. Additional detection/actuation mapping is available via the PC based configuration menu for cross zoning, individual detection to actuation and the ability to disable individual detection and actuation zones. Offline PC programming is used to change control panel default settings.

Two automatic and a single dedicated manual release detection circuits are classified as Class B Style 4 with a 470k end of line device providing circuit supervisory resistance. Trouble conditions occur if the circuit resistance is less than (*t.b.d.*) ohms or greater than (*t.b.d.*) ohms.

A fire condition is defined as circuit resistance from zero to 100 ohms. Any normally open fire detecting device (linear thermal wire, spot thermal sensors, separately powered analog thermal or smoke detectors) may be used when terminated with the end of line device provided with the control panel. To conserve battery life, the detection circuits are periodically monitored approximately every three seconds. The manual input is monitored every (*t.b.d. to maximize battery life*) seconds.

Actuation Circuits

Two separate actuation circuits are capable of delivering xx amps at yy vdc which is sufficient to actuate up to six Stat-X aerosol generators per each of two separate actuation zones. Actuation circuit power is supplied via the primary or secondary battery to a bank of super capacitors. Upon Fire detection, the control panel provides electrical power to charge the supercapacitor bank. This may result in a delay of up to ten seconds.

Abort Switch Input

A supervised, normally open remote abort switch may be provided which allows for delayed actuation in the event of automatic initiation (detection). If a discharge delay has been programmed, the countdown timer does not stop the actuation timer. The Manual Release input will override the Abort Switch operation and any other programmed delays and mapping configurations. Both actuation zones will fire upon Manual Release switch closure.

I-O Contacts

Optically isolated, relay contacts are available for inputs and outputs and are intended for use in controlling external relays or other annunciation devices. A set of dedicated relay contacts are provided to allow for control panel status supervision by a remote fire alarm control panel (FACP). The dedicated FACP relay contacts provide for an end of line resistor whose value can be varied depending on remote control panel supervisory resistance requirements. NO-Fire and NC-Trouble sets of contacts may be wired to a remote FACP. This allows the remote FACP the ability monitor the status of the FireAway Local Alarm panel. Other i-o's consist of (2) separate form C outputs which may be used for pre-alarm and alarm indication. Output transfer timing to be adjustable in 5 second increments from 0 to 30 seconds. Output control contacts may be mapped to individual detection inputs. Both sets of relay contacts may be programmed for momentary transfer by pressing the front panel Reset Switch. This function may be used for interrupting power to latching function initiating devices (latching relay base smoke detectors). I-O contact ratings are ½ amp at xx vdc.

System Programming

Offline programming is only possible when the control panel is placed in programming mode. The programming function is enabled by a sequence of keystrokes on the front panel accessed via the locked front cover. The audible alarm will double pulse and the Green System OK LED will single pulse when entering the programming mode. If no input is received for 1 minute, the control panel will automatically exit from programming mode. Pressing the System Reset or selecting disconnect via the offline programmer will manually exit programming mode.

External programming of detection/actuation mapping, discharge delays, i-o connections and clock settings is performed from a PC via an M8 front panel programming port. The Advantage control panel must be physically connected to a PC by opening the locked hinged cover. The Programming Mode is initiated by pressing the Alarm Silence-System Reset buttons simultaneously. All LED's flash and the audible buzzer sounds 2x when entering programming mode. If no programming interaction is performed, the control panel will return to Normal operation after three minutes. The return to Normal operation from Programming mode is indicated by all LED's flashing and the audible alarm sounding 1x. While in programming mode, the PC configuration program allows the user to select programming options, save the options,

download events, monitor system voltage inputs, set the internal clock and exit from the programming mode.

If system firmware requires an update, the front panel programming port is available to upload revised firmware. All firmware revisions are controlled by listing agencies and can only be performed with authorized approval.

Supervision and Annunciation

Both primary and secondary battery pack power supplies are continuously supervised for low voltage, polarity and presence. If the Advantage-Lithium panel detects a low battery voltage condition, the panel automatically switches to the secondary backup battery. A Trouble condition is signaled when operating in secondary mode. A trouble condition will exist when primary power is not operational or when the battery voltage drops below predetermined safe voltage/capacity levels. At that point the control panel is operating from the secondary battery only.

All field wiring circuits are power limited to approximately 3.6 vdc. The control panel and its field wiring circuits are by design isolated from ground fault however in order to meet approval agency standards, a ground fault circuit is provided via a separate panel wiring connection. In the event of a non normal condition present in any of the supervised circuits, a trouble LED will illuminate and the front panel piezo buzzer will sound.

A Fire condition is indicated by a constant ON audible alarm and zone alarm red LED being illuminated.

A Trouble condition is indicated by a pulsing Service System LED and pulsing audible alarm which sounds once every ten seconds.

A PreAlarm signal is displayed if mapping for detection to actuation zones is selected to be Cross Zoned. The PreAlarm signal occurs if a single zone indicates alarm. The audible alarm will double pulse ½ second ON every 5 seconds.

A supervised local piezo buzzer is located on the control panel front cover. The buzzer provides audible alarm in the event of a Fire or Trouble condition. A push button is located on the inside of the control panel which may be used to silence the audible alarm. An LED indicator illuminates when the silence enable function is operated. The audible alarm will sound if the Fire or Trouble condition has not been cleared after the audible has been silenced for six hours or if a new Trouble or Alarm condition is detected.

Visual LED indications are visible through a window on the hinged front cover. LED indications are visible for System Normal (green). A single Alarm LED for detection zone 1, detection zone 2 and manual release (red). A Service System LED indicates a Trouble condition (yellow). A Battery Fault LED indicates a problem with either the primary or secondary batteries (yellow). The Alarm Silence LED (yellow) is also visible through the front cover. A key lock is provided to prevent access and tampering to internal components by unauthorized individuals. Upon opening the front cover, the Alarm Silence, System Reset, Push to Test push buttons and System Disable toggle switches may be accessed. The Alarm Silence push button is only active when the audible alarm is ON. The audible cannot be pre-silenced. The System Reset push button will clear all latched alarms and latched relay outputs once an Alarm condition has been cleared. The Push to Test button will illuminate all LED's, sound the audible alarm and transfer relays. Pressing the System Reset button will clear the latched relays. The programming mode is enabled by pressing and holding the Alarm Silence and System Reset buttons simultaneously for 5 seconds. The audible alarm will pulse 2x and the Green System OK LED will flash.

A real time clock is present and must be set when the system is commissioned. This clock is powered by a supercapacitor which may lose voltage if the control panel remains unpowered for extended periods beyond 3 weeks. The clock may be set via PC connection to the M8 front panel programming port.

Advantage-Lithium Start Up Process

When the Advantage-Lithium panel is initially powered up or batteries have been replaced, the panel enters a brief Start Up mode. Start up consists of the following,

- Green LED ON for approximately 5 seconds – boot loader mode
- All LED's flash 2x – end of boot loader mode
- Green LED flashes quickly - actuation capacitors charging
- All LED's flash 3x – end of capacitor charge mode
- Slow Green LED flash – Normal Operation

3) FireAway Advantage Control Panel Agency Approvals & Notes

The agency approvals listed below are to be used for reference. The Advantage-Lithium panel design requires a deviation from any of the listed approval standards as each requires an AC powered branch circuit and rechargeable backup batteries. All other applicable portions of the standards will apply however.

- UL864 2014 Edition
 - UL746C Standard for Polymeric Materials – Use in Electrical Equipment Evaluations
 - UL 50 Standard for Enclosures for Electrical Equipment
- ULC
- FM3010:2018
 - Control panel identified as a Fire Alarm Control Unit (FACU) (sect 1.10)
- BS EN54-2
 - Power supply must comply with EN54-4 (3.1.4)
 - Power available indicator needed (5-4)
 - Cross references to alarm devices as described in EN54-1 (7.12)
 - Microprocessor failure Trouble condition described (8-5)
 - Any change of state Alarm or Trouble will resound the silenced audible alarm (8.6.3)
 - Disabled condition must provide for a visual indicator per section 9
 - Agency submittal info required as described in section 12
 - Audible alarm volume reqmts (12.10.2)
 - Fire Alarm = 60 dBA at 1 meter
 - Trouble Indication = 50 dBA at 1 meter
 - Software operation documentation (13.2.1)
 - Manufacturing design documentation (13.2.2)

- Product marking reqmts section 14
-
- EN 12094-1 (2003)
 - Power supply must comply with EN54-4 (4.1)
 - Environmental specs may include min & max temps plus corrosive atmosphere as defined by EN 60721-3-3
 - We may want separate actuation zone Alarm indications per 4.9.1
 - In the case of cross zoning we need a pre-alarm if one zone is in alarm
 - Output from relay when Released Condition exists (4.11.2)
 - Much discussion regarding disable, hold and abort conditions
 - To the point of requiring a different panel design?
 - Must allow for actuation disable (4.15.1)
 - LED indicators must be visible at an angle of 22.5 degrees and have a brightness of 500 lux (5.4.3.10)
 - Minimum sound pressure level = 60 dBA @ 1 meter (5.5)
 - Product marking per EN54-2 (sect 7)
 - Product documentation per EN54-2 (sect 8)
 - Agency submittal info per EN54-2 (sect 8)
 - Sulfur Dioxide testing (sect 9.5)

4) FireAway Control Panel Field Wiring and Auxiliary Wiring Connections

Connector – Pin i.d.	Function	Notes
Row A-1	Detection Zone 1 (+)	Class B with 470k eol
ROW A-2	Detection Zone 1 (-)	“
ROW A-3	Detection Zone 2 (+)	“
ROW A-4	Detection Zone 2 (-)	“
ROW A-5	Manual Release (+)	“
ROW A-6	Manual Release (-)	“
ROW A-7	Actuation Zone 1 (+)	0 to 2 ohm supervision with x amp output
ROW A-8	Actuation Zone 2 (-)	“
ROW A-9	Actuation Zone 2 (+)	“
ROW A-10	Actuation Zone 2 (-)	“
ROW A-11	Pressure Switch (+)	Normally Closed, Trouble when Open
ROW A-12	Pressure Switch (-)	“
ROW A-13	Abort Switch (+)	Class B with 470k eol
ROW A-14	Abort Switch (-)	“
ROW B-1	NC - Relay 1	Maximum ½ Amp at 30 vdc
ROW B-2	Common - Relay 1	“
ROW B-3	NO - Relay 1	“
ROW B-4	NC - Relay 2	“
ROW B-5	Common - Relay 2	“
ROW B-6	NO - Relay 2	“
ROW B-7	NC - Relay 3	“
ROW B-8	Common - Relay 3	“
ROW B-9	NC Trouble – Relay 4	Remote FACP Supervisory Relay
ROW B-10	Common Trouble – Relay 4	
ROW B-11	NO Fire/Alarm (FACP EOL) – Relay 4	“
ROW B-12	Common Fire/Alarm (FACP EOL) – Relay 4	“
ROW B-13	NO Fire/Alarm – Relay 4	“
ROW B-14	Common Fire/Alarm – Relay 4	“



5) FireAway Advantage Panel Field Wiring Diagram

Insert AutoCad Electrical Field Wiring Schematic

6) Electrical, Mechanical and Environmental Specification Summary

Operational Requirements	UL 864	FM 3010:2018	EN54-2	EN 12094-1 (2003)
Thermal detector compatibility		X	Compliant with EN54 stds	Compliant with EN54 stds
Verified smoke detector compatibility	Independent power may not require compatibility testing 67.6	X	"	"
Notification Appliance Compatibility		X		
Rechargeable Batteries required	X	X		
On-Off cycling		6000 times sect 4.17		

Electrical Test Requirements

Electrical Test	Product Spec Limits	UL864 Reqmts	FM 3010:2018	EN54-2 Reqmts	EN12094-1 (2003)
ESD			Sect 4.29	Sect 15.8	Per EN54-2
EMC Radiated				Sect 15.9	"
Electrical Fast Transient Bursts		Sect 77	Sect 4.26	Sect 15.10	"
Slow High Energy Surge			Sect 4.19	Sect 15.11	"
Main Voltage Dips and Interrupts				Sect 15.12	"
Supply Voltage Variations				Sect 15.13	"
Dielectric		Sect 80	Sect 4.18		
Reverse Polarity		Sect 90	Sect 4.20		
Surge Line Transients		Sect 77.3	Sect 4.27		
Component max temp			Sect 4.23		
Power Limited Circuits test			Sect 4.24		
RFI Immunity		Sect 84	Sect 4.25		
Internal Transients		Sect 77.2	Sect 4.28		

Mechanical Test Specifications

Mechanical Specifications	Product Specification Limits	UL864 Reqmts	FM 3010:2018	EN54-2 Reqmts	EN12094-1 (2003)
Impact (Shock) Operational	t.b.d.	Sect 74.1	Sect 4.16	Sect 15.6	Per EN54-2
Vibration (sinusoidal operational)			Sect 4.15	Sect 15.7	"
Vibration (sinusoidal endurance)			Sect 4.15	Sect 15.15	"

Environmental Specifications

Environmental Specifications	Product Specification Limits	UL864 Reqmts	FM 3010:2018	Marine (Coast Guard Tests)	EN54-2 Reqmts	EN12094-1 (2003)
Operating Temperature Range:	-40F to +157F					
Cold	n/a	Sect 71.2			Sect 15.4	Per EN54-2
High temp		Sect 71.3				
Damp Heat, Steady State	n/a	Sect 71.2		Sect 92	Sect 15.5	"
Water Ingress	IP65/NEMA 4X				n/a	
Polymeric enclosures			Aged at 194F for 7 days or 158F for 28 days	Sect 92.6	n/a	n/a
Salt Fog	t.b.d.	Humidity 71.4				Minimum IP54 for class C & D environments
Corrosion				Sect 92.1	n/a	
Hydrogen Sulfide				Sect 92.2		
Dust Test				Sect 92.3		
Water Spray Test				Sect 92.4		
Gasket Test				Sect 92.5		

Marking and Documentation Requirements

Marking and Identification	UL864 Requmts	FM 3010:2018	EN54-2 Reqmts	EN12094-1 (2003)
Indication of the test standard			X	
the name or trademark of the manufacturer or supplier		X	X	X
the model or type designation		X	X	X
Production time period (serial no)		X	X	
Manufacturers Design Documentation			X	
the environmental class		X	X	X
Electrical Ratings	Sect 95.1		X	X
Use of the product	Sect 95.1		X	X
NFPA Standard Reference	Sect 95.1			
Power limited circuit identification	Sect 95.1.3			
Alarm Circuit Verification warning if used	Sect 95.1.10			
Mark per UL 969	Sect 95.2.3			
the maximum number of external connectable devices and transmission paths;			X	X
the maximum and minimum electrical ratings for each input and output;			X	X
Service type	Sect 31.1			
Max and Min temperatures	Sect 71.2/.3			
information on the communication parameters on transmission paths			X	X
recommended types of cable for each transmission path;			X	X
fuse ratings;			X	X
Installation instructions		X	X	X
Operating instructions		X	X	X
Configuring & Commisioning instructions			X	X
Maintenance & Testing Instructions		X	X	X
Conformity of Production		X		X



- 7) Design and Technical considerations per UL864, etc.
 - a) Electrical Features

8) System Operation (per UL 864, NFPA 72 etc) and Notes

Detection, Actuation & Relay Mapping

Definitions

Single Detection Alarm – Any single detection zone alarm will cause the mapped actuation zone to fire

Cross Zoning Alarm - Cross zoning requires one detector on each of two zones to be in an Alarm condition before actuation is engaged. A single sensor in alarm causes a Trouble condition on the panel. See the following tables for actuation and relay mapping.

Momentary transfer – A relay option which allows for a 1 second transfer when the control panel System Reset button is pressed. Used for resetting smoke detectors.

Advantage-Lithium Default Configuration			
Detection Zone	Enabled?	Actuation Zone	Delay
Zone 1	Yes	1	0
Zone 2	Yes	2	0
Manual Release	Yes	both	0
Pr. Switch	No	N/A	0
FACP Alarm Output	n/a	n/a	0
FACP Trouble Output	n/a	n/a	5
Relay 1	n/a	n/a	0
Relay 2	n/a	n/a	0
Relay 3	n/a	n/a	0

Detection-Actuation Mapping Options		
Detection Zone	Actuation Zone	Delay
Zone 1	1	0 – 30 5 second increments
	2	“
	Both zones	“
	Cross zoned ¹	“
	None	“
Zone 2	1	0 – 30 5 second increments
	2	“
	Both zones	“
	Cross zoned ¹	“
	None	“

Relay Mapping Options			
Relay	Default (sec)	Delay (sec)	RelayOperation Mapping Options
Relay 1	0	0 – 30	Transfer on single Detection Alarm
“ “	“ “	“ “	Transfer on Cross Zoning Detection Alarm
			Transfer on Trouble condition
Relay 2	0	0 – 30	Transfer on single Detection Alarm
“ “	“ “	“ “	Transfer on Cross Zoning Detection Alarm
	“ “	“ “	Transfer on Trouble condition
	“ “	“ “	Follows function of Local Audible - Silencable
Relay 3	0	0	Transfer on single Detection Alarm
“ “	“ “	“ “	Transfer on Cross Zoning Detection Alarm
“ “	“ “	“ “	Momentary Transfer when Reset Button is pressed
Relay 4 FACP Alarm	0	0 – 30	Transfer on single Detection Alarm
“ “			Transfer on Cross Zoning Detection Alarm
Relay 5 FACP Trouble	5	0 – 30	Transfer on any Fault

Relay Programming Options				
Relay	Single Fire Alarm	Dual Fire Alarm (cross zoning)	Trouble Condition	Momentary transfer with Reset Button
1	●	●	●	○
2	○	○	○	○
3	○	○	○	●
4	●	●	○	○
5	○	○	●	○
● = Yes				
○ = No				

Fire Alarm Examples

Example 1 – Two zones with single detection and actuation

- Detection zone 1 goes into alarm due to a relay base smoke detector fire detection.
 - Actuation occurs on zone 1.
 - The audible alarm sounds
 - Relay 1, 2, & 4 transfer per mapping
- To reset the latched smoke detectors, the Reset button is pressed
- If no smoke is present, the smoke detector relay base will reset
 - The activated relays will reset if the Fire condition is cleared
 - If the actuation devices are fired (open) a Trouble condition will exist until the actuation devices are replaced
 - All Trouble relays will remain engaged until the actuation devices are replaced

Example 2 – Two zone cross zoned detection and actuation. Requires two separate smoke detectors in alarm to actuate the system

- Detection zone 1 goes into alarm due to relay base smoke detector fire detection
 - A Trouble condition is annunciated at the panel
 - Relay 1 is programmed as Transfer on cross zoned detection.
 - Relay 1 does NOT transfer
 - Relay 2 is programmed as Transfer on Trouble condition.
 - Relay 2 transfers
 - Relay 5 (*FACP Trouble*) Trouble relay transfers
- Detection zone 2 goes into alarm due to relay base smoke detector fire detection
 - Both Actuation zones are released
 - Relay 1 Transfers
 - Relay 4 (*FACP Fire*) Transfers
- To reset the latched smoke detectors, the Reset button is pressed
 - If no smoke is present, the smoke detector relay base will reset
 - If the actuation devices are fired (open) a Trouble condition will exist until the actuation devices are replaced
 - All Trouble relays will remain engaged until the actuation devices are replaced

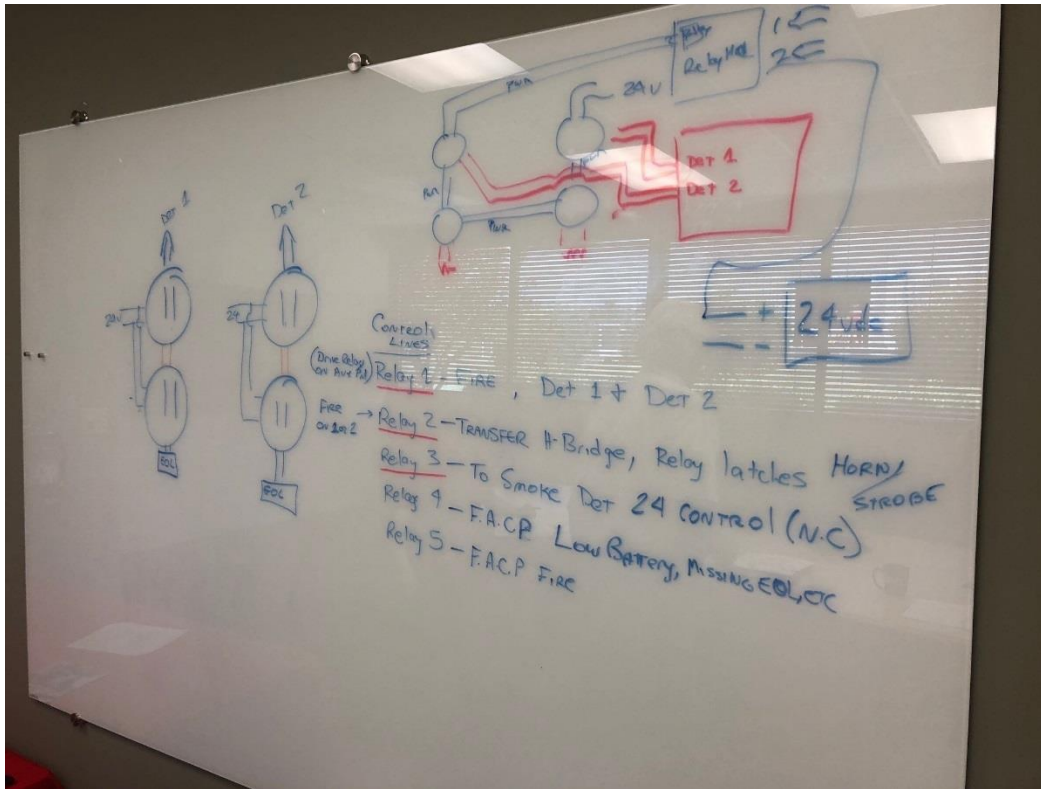


Figure 1- Picture from Jim's Presentation 7-10-19

UL 864 Required Operation

1. Maximum of 10 seconds from from Alarm initiation to Alarm notification
2. Alarm indicated at local premises
3. Alarm zone must be indicated
4. Low priority alarms must be overridden by High priority alarms
5. Alarm silence may be provided but a visual indicator must be illuminated
6. Alarm silence activation must be accessed via a key lock enclosure
7. Alarm silence must reactivate the audible after a minimum of 24 hours
8. Audible alarm will resound if silenced in the event of a subsequent alarm
9. A trouble signal must be distinct from an alarm signal and must sound every 10 seconds with a minimum duration of ½ second
10. An abort switch may be provided if required
11. A manual release switch overrides any programmed delays but will not override an abort switch
12. Cross zoning may be provided
13. If cross zoning is used, a single detection alarm energizes the alarm evacuation signal

9) Control Panel Programming Interface Port

Data to be Accessed & Displayed during Programming Mode session

The following screen shots are taken from the prototype FireAway Advantage-Lithium configuration software

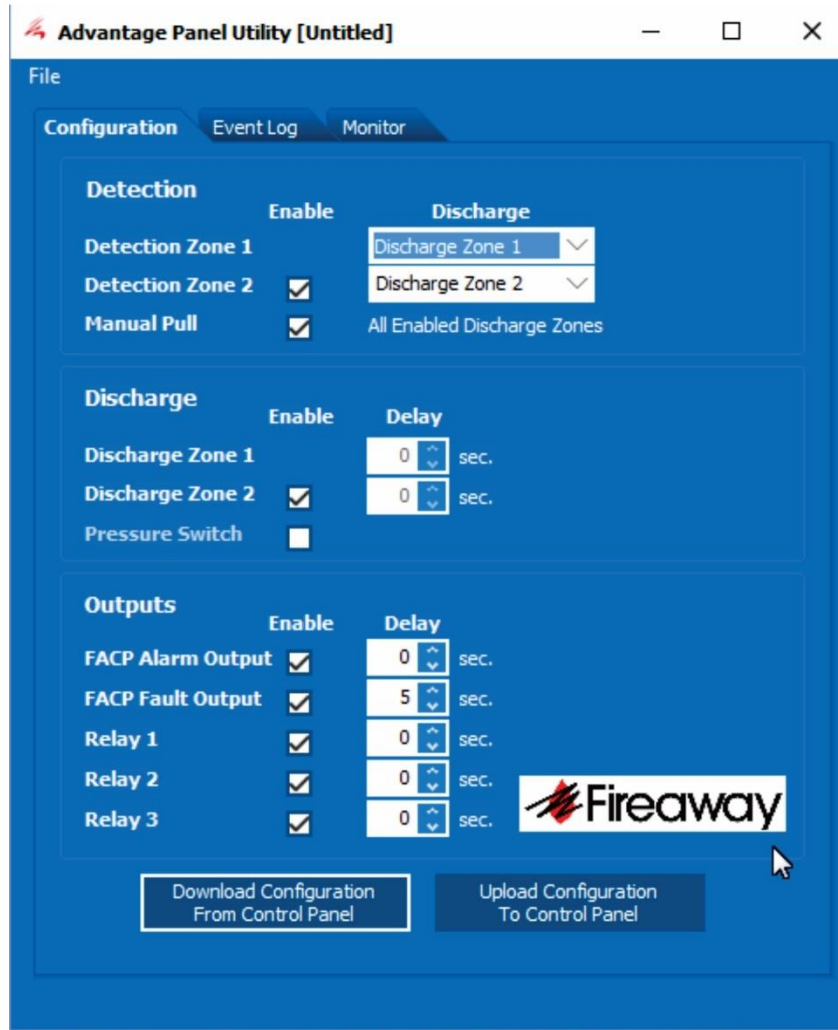


Figure 2- Configuration Mode

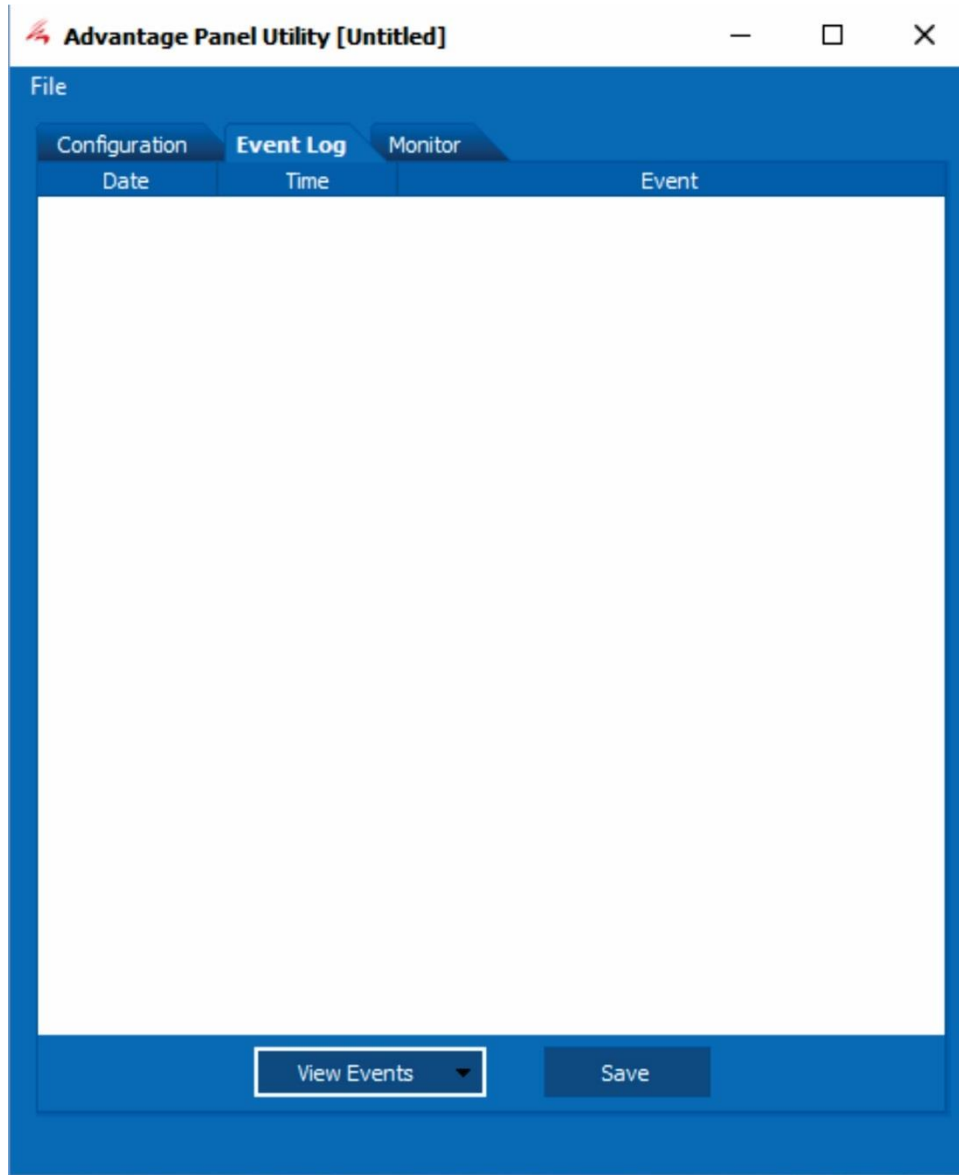


Figure 3 - Event Log Download screen



Figure 4 - Monitor Mode Menu

Data Access	Displays	Display Note
Configuration Menu	Used to remotely program and configure control panel settings	1
Event Log Menu	Used to download events recorded as FIFO up to 100 events	2
Monitor Mode Menu	Used to verify system status	3
Primary & Secondary Battery Voltage	Current actual input voltage	4
Manual Release Status	Current Open/Closed status	5
Class B Detection Zone 1 Status	Current Open/Closed status	5
Class B Detection Zone 2 Status	Current Open/Closed status	5
Actuation Circuit 1 Status	Current Open/Closed status	6
Actuation Circuit 2 Status	Current Open/Closed status	6

Pressure Switch Status	Current Open/Closed status	7
FACP supervised output	Current System OK/Alarm/Fault status	8
Aux Relay 1 Status	Open – Closed status	9
Aux Relay 2 Status	Open – Closed status	10
Aux Relay 3 Status	Open – Closed status	11
Abort Switch Status	Open/Supervised/Closed	12

Display Notes:

- 1) This would be as close to practical a measure of the actual battery voltage input prior to diode drops, etc. It may not be entirely realistic as to measure voltage we likely have to provide measurement device protection
- 2) I'd like to see the detection circuit resistance in real numbers along with a horizontal bar with 0-100 ohms in red indicating Alarm, followed by 101-1500 ohms in yellow indicating Trouble, followed by 1501-3000 ohms in green indicating OK followed by 3001+ in yellow indicating Trouble (*however we really ought to drop the Hi Trouble to 2300 ohms as that would be the max contact closure alarm level....*)
- 3) Actuation Circuit LED screen color would either be a Green=Normal, Yellow=Open/Ground Fault. A Red=Fired would indicate the system has recorded a Fire but the Actuator has not been replaced. *This could help in the event of a case shorted actuator. However Quentin's ground fault circuit could help here. Let's consider it t.b.d.*
- 4) Pressure Switch indication would be either a Green=closed, Yellow=Trouble or Red=Open. No voltage display needed.
- 5) Auxiliary FACP Supervised Relay – Common, NC-Trouble, NO-Fire, EOL resistor positions. Red = Fire, Yellow = Trouble
- 6) Relay – Status to be either Open = Green or Transferred = Red

10) System Components and Key Part Numbers

Key Component Part Numbers (*part descriptions will likely change*)

Part No.	Description
830030	Control Panel Assembly (includes panel, qty (3) end of line devices, key for panel access)
830007	End of Line Device
830031	Replacement Battery Assembly
t.b.d	Replacement Lock and Key
83001x-yyy	Spot Thermal Sensor, x = environment, y = temperature rating
83002x-yy	Linear Thermal Sensor, x = type, y = temperature rating
830002	Alarm Test Module
830036	Mounting Kit, Advantage-Lithium, DIN Rail
830037	End of Line Resistor Kit (qty 10)
830042	Expansion Module, Advantage-Lithium, Annunciation and Detection
	Terminal Strip, Replacement, 14 posn, pluggable
830043	Advantage Panel Computer Interface & Software, RS485 to USB

11) Application, Design & Miscellaneous Notes

1. Battery packs are DOT compliant per DOT Verification of Compliance Report Number 3541324BAT-001 tested to UN Manual of Tests and Criteria, Part III, sub-section 38.3.
2. The elapsed time between activation of an alarm initiating device and automatic system response shall not exceed 10 seconds
3. Can we clean up the power failure to battery backup to normal to backup “noise/hysteresis” by providing a low voltage delay and latching on the secondary battery once the delay has been exceeded?
4. Need to find a convenient, environmentally survivable lock and key mechanism.
5. Allow for cursor hover over windows tabs, buttons and data for Quick Tips as to what they represent.
6. Boot loader via programming port?
 - a. Determine how many pins are needed
7. Note that both terminals strips are 14-position. We need to perform a DFMEA to determine if damage to the pcb can occur when the terminal strips are inadvertently switched.
8. We should consider a “no battery” trouble condition. Similar to the heartbeat monitor we reviewed earlier to verify whether an electronic pulse was occurring on the detection circuits.

9. The panel should indicate an Alarm condition if an Alarm occurs while the Actuation disable switch is engaged.
10. If the panel recognizes an Alarm condition when initially powered up, it should indicate the alarm but toggle between Alarm and fault. No discharge should occur.

Drawings and Models on Website and Replacement Parts

Other items

Need programming instructions

Need QR Code here somewhere

Need start up flash code sequence

Show a table with panel conditions, LED and audible displays