Altronix®

AL602ULADA
NAC Power Extender

Installation Guide
(See Application Guide for additional information)

MEA Approved

FM APPROVED

Rev. 031803

AL602ULADA - NAC Power Extender

Overview:

The Altronix AL602ULADA is an extremely cost effective 6.5 amp voltage regulated remote power supply/battery charger. It may be connected to any 12 or 24 volt Fire Alarm Control Panel (FACP). Primary applications include Notification Appliance Circuit (NAC such as strobes and horns) expansion support to meet ADA requirements. It also provides auxiliary power to support system accessories. The unit delivers regulated and filtered 24 or 12 volt power to Class B or Class A NAC loop circuits. Additionally, a separate 1.0A auxiliary output with reset for four (4)-wire smoke detectors is available. The 6.5 amp rated supply current can be divided between the four (4) outputs for powering NAC devices. Each output is rated at 2.5 amp max., and can be independently programmed for Steady, Temporal Code 3 or Strobe Synchronization. All outputs may be programmed for Input to Output Follower Mode (output will follow input. i.e. March Time Input, March Time Output). An individual output of 4 amp is achieved by paralleling 2 outputs. In non-alarm condition independent loop supervision for Class A and/or Class B FACP NAC circuits is provided. In the event of a loop trouble the FACP will be notified via the steered input (input 1 or input 2). In addition, there are common trouble output terminals (N.C., C, N.O.) which are used to indicate general loop/system trouble. A common trouble input is provided for optional NC (normally closed) devices to report trouble to the FACP. Two (2) FACP signaling outputs can be employed and directed to control supervision and power delivery to any combination of the four (4) outputs. The unit also features "Loop Output" trouble memory indication to help identify trouble some sporatic problems.

Specifications:

Agency Listings:

- UL Listed Control Units and Accessories for Fire Alarm Systems (UL 864) and UL Listed Standard for Safety for Fire Protective Signaling Systems (UL 1481).
- MEA - NYC Department of Buildings Approved.
- CSFM - California State Fire Marshal Approved.
- FM - Factory Mutual Approved.
- NFPA 72 Compliant.

Input:

- Power input 115VAC / 60 Hz, 1.45 amp.
- Two (2) Class A or two (2) Class B FACP inputs.

Output:

- Class 2 Rated power limited outputs.
- Field selectable 24VDC or 12VDC voltage regulated power limited outputs.
- 24VDC or 12VDC rated @ 6.5 amp max total alarm current.
- 2.5 amp max current per output.
- Separate 1.0 amp auxiliary output with built-in and remote reset capability.
- Two (2) outputs may be paralleled for more power on an indicating circuit *(see Application Guide)*.
- Programmable supervised indicating circuit outputs: Up to Four (4) Class B or Two (2) Class A or One (1) Class A and Two (2) Class B *(see Application Guide)*.
- Thermal and short circuit protection with auto reset.

Battery Backup:

- Built-in charger for sealed lead acid or gel type batteries.
- Automatic switchover to stand-by battery when AC Fails.
- Zero voltage drop when switching over to battery backup.
- PTC battery protection.

Supervision:

- AC fail supervision (form "C" contact, 1 amp / 28VDC). Factory set for 1 minute with optional 18 hour delay setting (field selectable).
- Battery presence and low battery supervision (form "C" contact, 1 amp / 28VDC).

Visual Indicators:

- Input and output status LED indicators.

Special Features:

- 2 wire horn/strobe Sync mode allows audible notification appliances (horns) to be silenced while visual notification appliances (strobes) continue to operate.
- Temporal Code 3, Steady Mode, Input to Output Follower Mode (maintains synchronization of notification appliances circuit).
- March Time.
- Compatible with 12 or 24VDC fire panels.
- Output loop supervision steered to input 1 or input 2.
- Signal circuit trouble memory (helps identify intermittent loop problems).
- Common trouble input and output.
- Ground fault detection.

Added Features:

- Unit includes power supply, red enclosure, cam lock, open frame transformer and battery leads.

Enclosure Dimensions and Descriptions:

AL602ULADA

15.5"H x 12"W x 4.5"D

Product Weight:

17 lbs.

Power Supply Specifications:

AC Input:	115VAC / 1.45 amp @ 60Hz.
Output:	12 - 24VDC. Maximum 2.5 amp per output. Total of 6.5 amp in Alarm Condition *(see note below).*
Battery:	For 12VDC operation use a 12VDC / 12AH battery. For 24VDC operation use two (2) 12VDC / 12AH or two (2) 12VDC / 7AH batteries connected in series.
Stand-by/Alarm Current:	75mA/150mA
EOL Resistor (end of line):	2.2K (2200 ohm). Altronix Model # AL-EOL22 (included).

Stand-by Specifications:

Stand-by Batteries	**Stand-by Time**	**Alarm Output Total Amp/Minutes**	**Aux Output Current**
24VDC/12AH	24 Hours	6.5 amp/15 Minutes	50mA
(use two (2) 12VDC batteries in series)	60 Hours	6.5 amp/5 Minutes	-
24VDC/7AH	24 Hours	6.5 amp/5 Minutes	-
12VDC/12AH	24 Hours	6.5 amp/15 Minutes	50mA
	60 Hours	6.5 amp/5 Minutes	-
24VDC/36AH Battery	24 Hours	6.5 amp/15 Minutes	1 amp
12VDC/36AH Battery	24 Hours	6.5 amp/15 Minutes	1 amp

Note: Unit is equipped with 1 amp max. auxiliary output: "AUX" will remain battery backed up during power outage. For loads connected to "AUX" please, refer to battery "Stand-by Specifications" above for ratings. When loads are connected to "AUX" output during alarm condition, the remaining outputs may, not exceed 6.5 amp total alarm current (example: AUX = 1 amp, outputs up to 5.5 amp).

Installation Instructions:

Units should be installed in accordance with article 760 of The National Electrical Code as well as NFPA 72 and all applicable Local Codes.

1. Mount in a desired location.
   Carefully review:
   Application Guide (for AL602ULADA, AL802ULADA, AL1002ULADA)
   Power Supply Specifications ***(pg. 3)***
   Stand-by Specifications ***(pg. 3)***
   Output Programming Selection Table ***(pg. 4)***
   Sync Mode Selection Table ***(pg. 4)***
   Terminal Identification Table ***(pg. 5)***
   LED Status Indication Table ***(pg. 6)***

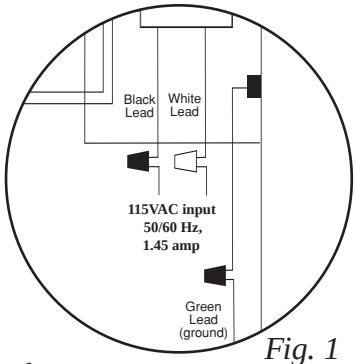


Fig. 1

2. Connect green lead to earth ground *(Fig 1).*
   Connect the black and white transformer leads of AL602ULADA to a separate unswitched AC circuit (115VAC, 60Hz) dedicated to the Fire Alarm System.
3. Set switch SW1 on Power Supply Board for desired output voltage. Open for 24VDC (factory set), Close for 12VDC.
4. Measure output voltage before connecting devices. This helps avoid potential damage.
5. Connect battery to terminals marked [+ BAT –] on the Power Supply Board (battery leads included). Use two (2) 12VDC batteries connected in series for 24VDC operation.
6. Set output selection switches marked (OUT1 through OUT4) to follow corresponding input (IN1 & IN2) and desired output signal type *(Output Programming Selection Table, pg. 4).*
7. Connect FACP output to desired AL600LGK logic board inputs, and notification appliances to desired AL600LGK logic board outputs *(see Application Guide).*
   Note: The 2-wire horn/strobe sync mode will only synchronize horns, horn strobes, strobes with synchronization capability.
8. For connection of smoke detectors, digital dialer *(Optional Hookup Diagram, pg. 7).*
9. To enable ground fault detection remove insulating washer located between standoff and the Power Supply Board (*Fig. 2B, p. 7*) and replace between mounting screw and the Power Supply Board (*Fig. 2C, p. 7*).

Class A, Class B, SW1 & SW2 Settings:

- For all Class B hookups SW1 & SW2 on the AL600LGK logic board must be open.
  For all Class A hookups SW1 & SW2 on the AL600LGK logic board must be closed.

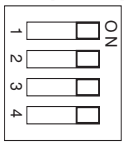
Output Programming Selection Table:

Outputs must be programmed independently (OUT1 - OUT4)

Function	Switch Positions ON	Switch Positions OFF	Descriptions
Input to Output Follower Mode	1	2, 3	Output follows signal it receives from the corresponding input (i.e. FACP Sync module - maintains synchronization of notification appliance circuit.
Temporal Code 3 Mode	3	1, 2	Enables Temporal Code 3 signal generation output. This mode will accept a steady or a pulsing input.
Steady Mode		1, 2, 3	A steady output signal will be generated. This mode will accept steady or pulsing input.
March Time Mode (60 beats per minute)	2, 3	1	Enables a March Time output which will sound 60 beats per minute. This mode will accept a steady or pulsing input.

For the above modes Dip Switch 4 determines which Input controls the corresponding output:
Switch 4 in the ON position causes output(s) to be controlled by input 1.
Switch 4 in the OFF position causes output(s) to be controlled by input 2.

(AL600LGK Board)
Output Dip Switches



INPUT SELECT
TEMPORAL
STROBE SYNC
IN>OUT SYNC

Sync Mode Selection Table:

Function	Switch Positions ON	Switch Positions OFF	Descriptions
Amseco Sync Mode*	1, 3, 4	2	This mode is designed to work with the Amseco series of horns, strobes, and horn/strobes to provide a means of synchronizing the Temporal-coded horns, synchronizing the flash timing of the strobe, and silencing the horns of the horn/strobe combination over a two-wire circuit while leaving strobes active.
Faraday Sync Mode*	2, 4	1, 3	This mode is designed to work with the Faraday series of horns, strobes, and horn/strobes to provide a means of synchronizing the Temporal-coded horns, synchronizing the flash timing of the strobe, and silencing the horns of the horn/strobe combination over a two-wire circuit while leaving strobes active.
Gentex Sync Mode* Gentex is a registered trademark of Gentex Corporation.	1, 2, 3, 4		This mode is designed to work with the Gentex® Commander GOS and ST/HS series of horns, strobes, and horn/strobes to provide a means of synchronizing the Temporal-coded horns, synchronizing the flash timing of the strobe, and silencing the horns of the horn/strobe combination over a two-wire circuit while leaving strobes active.
System Sensor Sync Mode* System Sensor is a registered trademark of Honeywell.	1, 2, 4	3	This mode is designed to work with the SpectrAlert™ series of horns, strobes, and horn/strobes to provide a means of synchronizing the Temporal-coded horns, synchronizing the one-second flash timing of the strobe, and silencing the horns of the horn/strobe combination over a two-wire circuit while leaving strobes active.

Note: The AL602ULADA will only synchronize horns, horn strobes and strobes that contain synchronization capability. Contact signal manufacturer for more detailed info. The same synchronization mode must be selected for all outputs.

Note: It is required to control visual notification appliances (strobes) via input 1 (IN1) and audible notification appliances (horns) via input 2 (IN2). This allows audible notification appliances (horns) to be silenced while visual notification appliances (strobes) continue to operate.

Terminal Identification Table:
AL600LGK Logic Board

Terminal Legend	Function/Description
IN1+, IN1- IN2+, IN2-	These terminals connect to the 12 or 24VDC FACP notification appliance circuit outputs. (Class A or Class B) Input trigger voltage is 9-30VDC @ 5mA min. Terminal polarity is shown in alarm condition. During an alarm condition these inputs will cause the selected outputs chosen to drive notification appliances. The designated outputs are set by output switches OUT1 through OUT4 *(see Output Programming Selection Table, pg. 4).* A trouble condition on an output loop will cause the corresponding input to trip the FACP by opening the FACP loop. An alarm condition will always override trouble to drive notification appliances.
RET1+, RET1- RET2+, RET2-	For Class A hookups these terminal pairs return to FACP NAC1 and/or NAC2. For Class B hookups the FACP EOL resistor from the NAC1 and/or NAC2 outputs are terminated at these terminals. Optionally, other notification appliances or additional signaling circuit power supplies may be connected to these terminals. If this option is chosen the EOL resistor must be terminated at the last device.
+ OUT1 – + OUT2 – + OUT3 – + OUT4 –	Notification appliances are connected to these outputs *(Typical Application Diagrams pg. 2-4 of Application Guide).* Each power limited output will supply 2 amp. Two (2) outputs may be connected in parallel for a maximum NAC output capability of 4 amp. Total supply current is 6.5 amp *(see note below)*. Outputs are controlled by designated input 1 (IN1) or input 2 (IN2) *(Output Programming Selection Table, pg. 4).*
C "FAULT" N.C. (Common trouble input)	An open circuit across this pair of terminals will cause IN1 and IN2 to simultaneously signal a trouble condition back to the FACP (Typically used to report AC or BAT Fail). (form "C" contact 1 amp / 28VDC) *(Fig. 2C, pg. 7).*
N.C., C, N.O. (Common trouble output)	These are dry contact trouble outputs that follow any general loop/system trouble conditions. (Typically used to trigger a digital communicator or other reporting device). (form "C" contact 1 amp / 28VDC) *(Fig. 2C, pg. 7).*
- AUX+	This separate 1 amp auxiliary output is typically used to power 4-wire smoke detectors. It can be reset (voltage drops out) by pressing the momentary aux reset switch on the AL600LGK logic board or via the N.O. "REMOTE" C terminals *(Fig. 2, pg. 7).*
N.O. C "REMOTE"	A momentary dry contact closure across these terminals interrupts the – AUX+ power output to reset 4-wire smoke detectors

Note: Unit is equipped with 1 amp max. auxiliary output: "AUX" will remain battery backed up during power outage. For loads connected to "AUX" please, refer to battery "Stand-by Specifications" above for ratings. When loads are connected to "AUX" output during alarm condition, the remaining outputs may, not exceed 6.5 amp total alarm current (example: AUX = 1 amp, outputs up to 5.5 amp).

*Power Supply Board**

Terminal Legend	Function/Description
AC/AC	Low voltage AC input.
– DC +	12VDC or 24VDC @ 6.5 amp continuous non-power limited output.
AC FAIL C, N.C., N.O.	Form "C" dry contacts used to signal the loss of AC, with AC present terminals N.O. and C are open, N.C. and C are closed. When loss of AC occurs terminals N.O. and C close, N.C. and C are open.
BAT FAIL N.O., N.C., C	Form "C" dry contacts used to signal low battery voltage or loss of battery voltage. Under normal conditions terminals N.O. and C are open, N.C. and C are closed. During a trouble condition terminals N.O. and C are closed, and N.C. and C are open *(Fig. 2, pg. 7)*.
+ BAT –	Stand-by battery input (leads provided). Use two (2) 12VDC batteries wired in series for 24VDC operation.

**Power Board Parameter Specifications:*

- AC Fail condition will report approximately thirty (30) seconds after loss of AC. To delay report for 6 hours cut jumper J1 on the Power Supply Board (AC trouble output delay option). If this mode is selected the Power Supply Board must be reset by removing all power to it for 30 seconds.
- Low battery condition will report at approximately 21VDC (24VDC output setting) or approximately 10.5VDC (12VDC output setting).
- Battery presence detection will report with in 5 minutes after battery remains undetected (missing or removed). A restored battery will report within thirty (30) seconds.

LED Status Indication Table:

LED	OFF	ON	BLINK (LONG)*	BLINK (SHORT)**
Out 1	Normal	Alarm Condition	Trouble Condition	Trouble Condition Memory
Out 2	Normal	Alarm Condition	Trouble Condition	Trouble Condition Memory
Out 3	Normal	Alarm Condition	Trouble Condition	Trouble Condition Memory
Out 4	Normal	Alarm Condition	Trouble Condition	Trouble Condition Memory
Input 1	Normal	Alarm Condition	Trouble Condition	—
Input 2	Normal	Alarm Condition	Trouble Condition	—
Fault	Normal	System Trouble	—	—
AC	AC Loss	AC present	—	—
DC	No DC Output	DC present	—	—

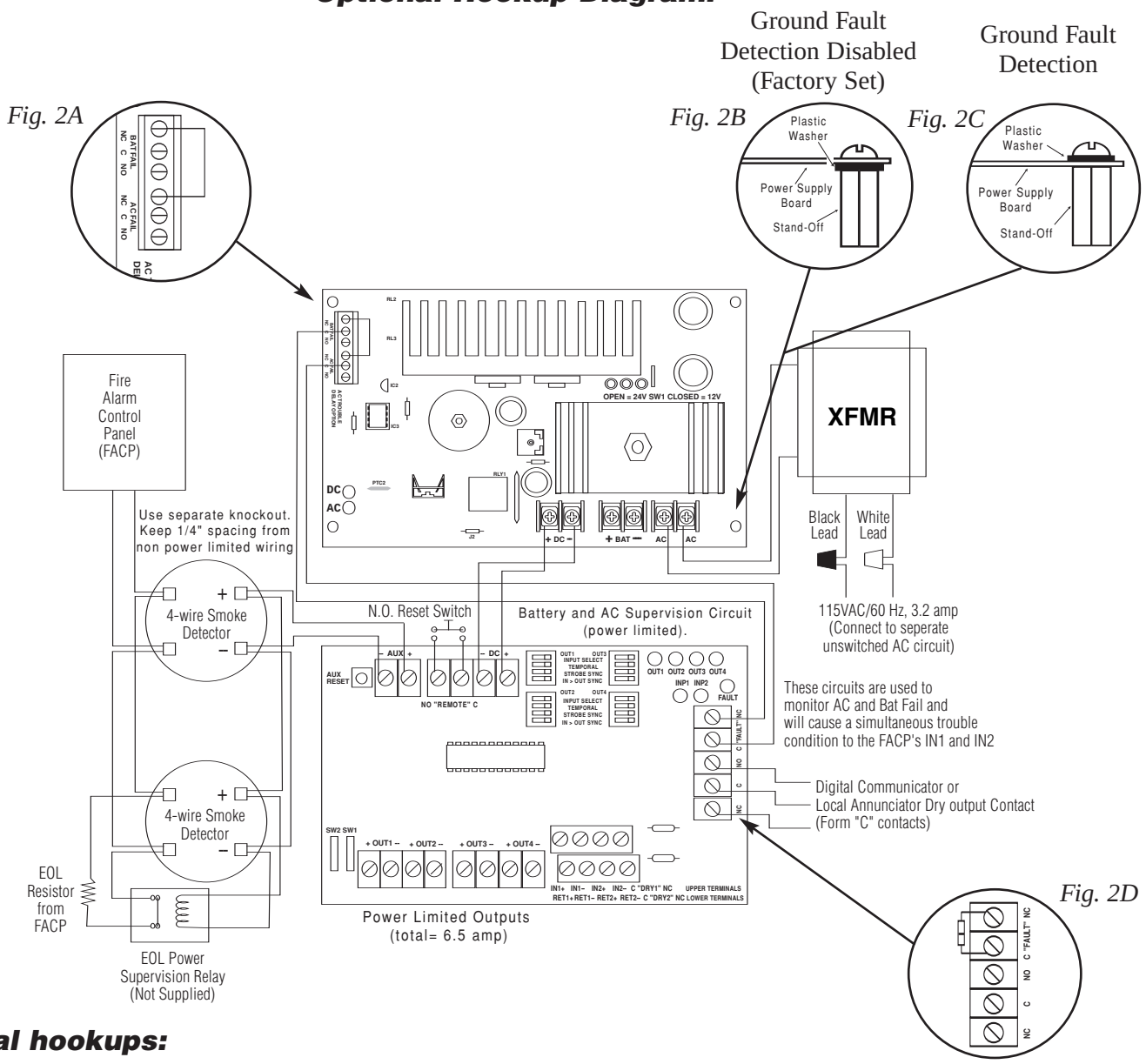
***** Indicates current trouble condition. When trouble (open, short or ground) occurs on a specific output, the corresponding red output LED, (OUT1-OUT4) will blink. The corresponding green input LED will blink as well. Loop trouble will report within 30 seconds.

****** Indicates trouble condition memory. When a trouble condition restores, the units red output LED, (OUT1-OUT4) will blink with a shorter and distinctly different duration. The green input LED(s) will be off (normal condition). To reset the memory remove and restore AC and battery power to the unit. The LED(s) will extinguish.

Note: If indicating circuits have been restored, memory reset is not required for normal operation of the unit.

Optional Hookup Diagram:

Fig. 2



Optional hookups:

1- Battery and AC monitoring: AC or Battery Fail condition will cause the common trouble input (C "FAULT" N.C.) to report back to the FACP via input 1 and input 2. The common trouble input may also be used for other optional supervisory monitoring.

To report AC and Battery Trouble connect the battery and AC Fail relay output shown in (*Fig. 2A*) to the common trouble input.

Note: If common trouble input, terminals marked [C "FAULT" N.C.] are not used, these terminals must be shorted (connect jumper) to remain inactive. For optional hookups (*Fig. 2D*)

2- Auxiliary output (-AUX+) provides 12VDC or 24VDC at 1 amp max. The output voltage is determined by the setting of switch marked SW1 on the Power Supply Board. It can be reset by a momentary closure across terminals (N.O. REMOTE C) or by pressing AUX RESET button on the AL600LGK logic board.

Ground Fault Detect: Factory set disabled *(Fig. 2B)*. To enable ground fault detection remove insulating washer between the board and standoff of the lower right power supply board mounting screw *(Fig. 2C)*.

Maintenance:

Unit should be tested at least once a year for the proper operation as follows:

Output Voltage Test: Under normal load conditions, the DC output voltage should be checked for proper voltage level *(Power Supply Output Specifications Chart).*

Battery Test: Under normal load conditions check that the battery is fully charged. Check specified voltage both at battery terminal and at the board terminals marked [+ BAT -] to insure there is no break in the battery connection wires.

Note: Maximum charging current is 700mA.

Note: Expected battery life is 5 years, however it is recommended changing batteries in 4 years or less if needed.

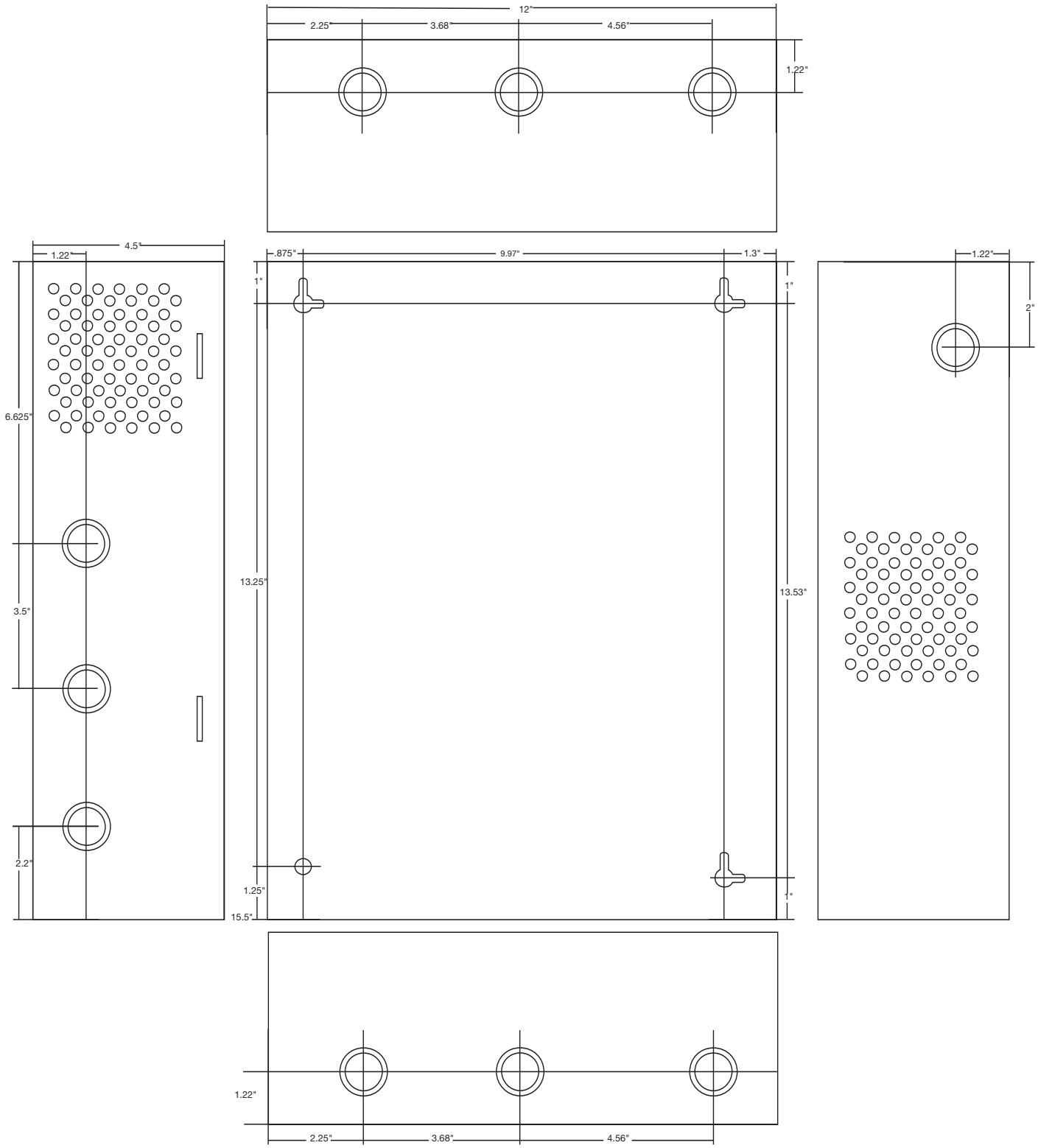
Battery Calculation Worksheet

	Device	Number of Devices	Current per Device		Stand-by Current	Alarm Current
	For each device use this formula:	This column	x This column	= Equals	Current per number of devices.	
	AL602ULADA	1	Stand-by:	80mA	80mA	
	(Current draw from battery)		Alarm:	175mA		175mA
A	**AL602 Current**				80mA	175mA
	Auxiliary Devices		Refer to device manual for current ratings.			
			Alarm/Stand-by	mA	mA	mA
			Alarm/Stand-by	mA	mA	mA
			Alarm/Stand-by	mA	mA	mA
			Alarm/Stand-by	mA	mA	mA
B	**Auxiliary Devices Current (must not exceed 1 amp)**					
	Notification appliances		Refer to device manual for current ratings.			
			Alarm:	mA	0mA	mA
			Alarm:	mA	0mA	mA
			Alarm:	mA	0mA	mA
			Alarm:	mA	0mA	mA
C	Notification Appliances Current must not exceed 6.5 amp (6500mA)				0mA	mA
D	Total alarm current				mA	mA
E	Total current ratings converted to amperes (line D x .001)				A	A
F	Number of standby hours (24 or 60 for NFPA 72, Chapter 1, 1-5.2.5).				H	
G	Multiply lines E and F.		Total stand-by AH		AH	
H	Alarm sounding period in hours. (For example, 5 minutes = .0833 hours.)					H
I	Multiply lines E and H.		Total alarm AH			AH
J	Add lines G and I.		Total stand-by and alarm AH		AH	
K	Multiply line J by 1.30. (30% extra insurance to meet desired performance)		Total ampere - hours required		AH	

Units are capable of recharging 36 AH battery max. If total ampere - hour required exceeds 27 AH, decrease AUX current to provide enough stand-by time for the application.

Enclosure Dimensions:

15.5”H x 12”W x 4.5”D



Notes:

Notes:

Altronix is not responsible for any typographical errors.

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