



# *Installation Guide: NAC Power Extender*

(See Application Guide for additional information)

Model:

***AL600ULADA***



# AL600ULADA - NAC Power Extender (Power Supply/Charger)

## Installation Guide

### Overview:

The Altronix AL600ULADA is an extremely cost effective 6.5 amp voltage regulated remote power supply/battery charger. The AL600ULADA may be connected to any 12 or 24 volt Fire Alarm Control Panel (FACP). Primary applications include Notification Appliance Circuit (NAC) expansion (supports ADA requirements) and will provide auxiliary power to support system accessories. The unit delivers regulated and filtered 24 or 12 volt power via four (4) Class B, two (2) Class A or two (2) Class B and one (1) Class A Notification Appliance Circuits. Additionally, a separate 50mA auxiliary output with reset for four (4)-wire smoke detectors. The 6.5 amp continuous supply current can be divided between the four (4) outputs for powering notification appliances. Each output is rated at 2 amp max. An individual output of 4 amp is achieved by paralleling 2 outputs. The AL600ULADA in non-alarm condition provides independent loop supervision for Class A and/or Class B FACP NAC circuits. In the event of a loop trouble the FACP will be notified via the AL600ULADA's steered input (input 1 or input 2). In addition, there are common trouble output terminals (NC, C, NO) 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 connected to AL600ULADA's inputs. These inputs can then be directed to controlsupervision and power delivery to any combination of the four (4) outputs.

### Specifications:

#### Agency Listings:

- UL Listed for Control Units for Fire Protective Signaling Systems (UL864) and for Power Supplies for Fire Protective Signaling Systems (UL1481)
- CSFM Approved - California State Fire Marshal.
- MEA Approved - NYC Department of Buildings.
- NFPA 72 Compliant.

#### Inputs:

- Power input 115VAC/60 Hz, 3.2 amp.
- Two (2) Class A or two (2) Class B FACP inputs.
- Compatible with 12VDC or 24VDC fire panels.

#### Outputs:

- Field selectable 24VDC or 12VDC voltage regulated power limited outputs.
- 24VDC or 12VDC rated @ 6.5 amp max.
- Separate 50mA auxiliary output with built-in and remote reset capability.
- Two (2) outputs may be paralleled for more power on an indicating circuit.
- Programmable EOL resistor supervised indicating circuit outputs:  
Four (4) Class B or Two (2) Class A or One (1) Class A and Two (2) Class B.
- Filtered and electronically regulated output.

#### Battery Backup:

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

#### Supervision:

- AC fail supervision (form "C" contact, 1 amp / 28VDC).
- Battery presence and low battery supervision (form "C" contact, 1 amp / 28VDC).

#### Visual Indicators:

- Input and output status LED indicators.

#### Special Features:

- Output loop supervision steered to Input 1 or Input 2.
- Common trouble input and output.
- Ground fault detection.

#### Added Features:

- Unit includes power supply, red enclosure, cam lock, open frame transformer and battery leads.
- Thermal and short circuit protection with auto reset.

#### Enclosure Dimensions:

15.5"H x 12"W x 4.5"D

#### Product Weight:

17 lbs.

**Power Supply Specifications:**

<b>AC Input:</b>	115VAC / 3.2 amp @ 60Hz
<b>Output:</b>	12VDC - 24VDC. Maximum 2.0 amp per output. Total of 6.5 amp in Alarm Condition.
<b>Battery:</b>	For 12VDC operation use a 12VDC / 12AH battery For 24VDC operation use two (2) 12VDC / 12AH batteries connected in series
<b>Stand-by Current:</b>	75mA
<b>EOL Resistor: (end of line)</b>	2.2K (2200 ohm)

**Stand-by Specifications:**

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

**Installation Instructions:**

The AL600ULADA 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 the AL600ULADA in a desired location. It is recommended to first review the following tables for screw terminals, switch selection and LED status indications. This will greatly facilitate installation hook-up.

**Carefully review:**

- Input / Output Selection Table* (pg. 4)
- LED Status Indication Table* (pg. 4)
- Terminal Identification Table* (pg. 5)
- Typical Application Diagrams* (pg. 6)

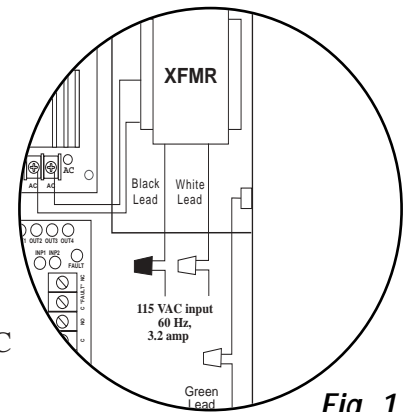
2. Connect the black and white transformer leads of AL600ULADA to a separate unswitched AC circuit (115VAC, 60Hz) dedicated to the Fire Alarm System (Fig. 1, pg. 3). Connect green lead to earth ground.

**Keep power limited wiring separate from non-power limited wiring (115VAC / 60Hz Input, Battery Wires). Minimum .25" spacing must be provided.**

3. Set switch SW1 on Power Supply Board for desired output voltage. Open for 24VDC (factory set), Close for 12VDC.

**Note:** It is important to measure output voltage before connecting devices. This helps avoid potential damage.

4. 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.
5. Set output selection switches marked (OUT1 through OUT4) to follow corresponding input (IN1 & IN2) (Input/Output Selection Table pg. 4).
6. Connect FACP output to desired AL600LGK logic board inputs and notification appliances to desired AL600LGK logic board outputs (Typical Application Diagrams pg. 6).
7. For connection of smoke detectors, digital dialer (Optional Hookup Diagram pg. 7).
8. To disable ground fault detection install insulating washer between the board and standoff (Fig. 4B/4C, pg. 7).



**Fig. 1**

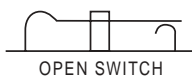
**General Information:**

- 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.
- AC Fail condition will report approximately one (1) minute 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 approximately 5 minutes after battery remains undetected (missing or removed).

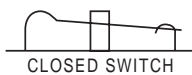
**Input / Output Selection Table:**  
**AL600LGK Logic Board**

Switch	Input 1	Input 2
OUT 1	Closed	Open
OUT 2	Closed	Open
OUT 3	Closed	Open
OUT 4	Closed	Open



OPEN SWITCH

Switch Detail



CLOSED SWITCH

**Note:** Switch positions determine which outputs will trigger from either Input 1 or Input 2.

**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 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.

\*\* 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.**

**Terminal Identification Table:  
AL600LGK Logic Board**

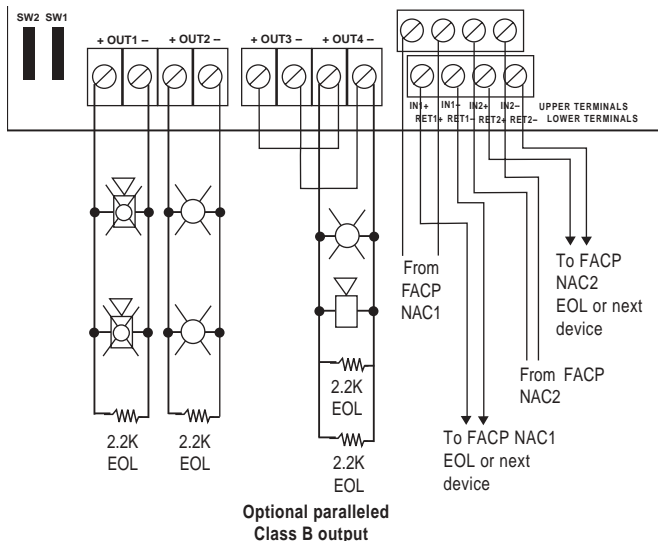
<b>Terminal Legend</b>	<b>Function/Description</b>
IN1+, IN1- IN2+, IN2-	These terminals connect to the 12 or 24VDC FACP notification appliance circuit outputs. (Class A or Class B) Input trigger voltage is 9-30VDC @ 5mA min. Terminal polarity is shown in alarm condition. During an alarm condition these inputs will cause the selected outputs chosen to drive notification appliances. The designated outputs are set by output switches OUT1 through OUT4 ( <i>Input/Output Selection Table pg. 4</i> ). 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 ( <i>Typical Application Diagrams pg. 6</i> ). 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. Outputs are controlled by designated input 1 (IN1) or input 2 (IN2) ( <i>Input/Output Selection Table pg. 4</i> ).
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) ( <i>Fig. 4D, pg. 7</i> ).
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). ( <i>Fig. 4D, pg. 7</i> ).
- AUX+	This separate 50mA 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 ( <i>Fig. 4, pg. 7</i> ).
N.O. C “REMOTE”	A momentary dry contact closure across these terminals interrupts the [ - AUX + ] power output to reset 4-wire smoke detectors

**Power Supply Board**

<b>Terminal Legend</b>	<b>Function/Description</b>
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 ( <i>Fig. 4, pg. 7</i> ).
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 NO and C are open, NC and C are closed. During a trouble condition terminals NO and C are closed, and NC and C are open ( <i>Fig. 4, pg. 7</i> ).
BAT+, BAT-	Stand-by battery input (leads provided). Use two (2) 12VDC batteries wired in series for 24VDC operation ( <i>Fig. 4, pg. 7</i> ).

## Typical Application Diagrams:

**Fig. 2**



### Class B hookup:

- Switches SW1 & SW2 on AL600LGK logic board must be in the open position.
- It is recommended (not required) to control visual notification appliances (strobes) via Input 1 (IN1) & to control audible notification appliances (horns) via Input 2 (IN2).

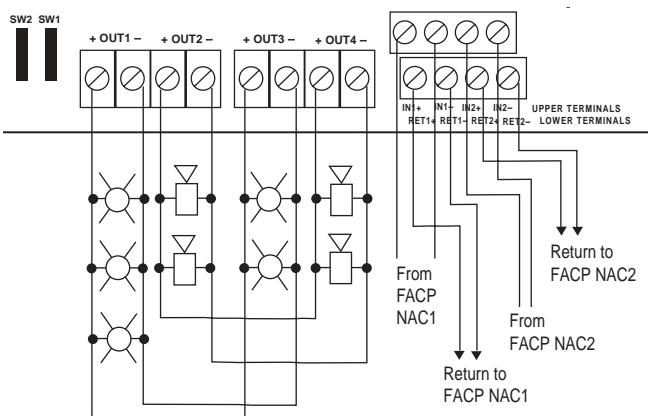
This facilitates the ability to silence audible notification appliances (horns) independently of visual notification appliances (strobes) during certain operations.

**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. 4D, pg. 7).

Two outputs may be connected in parallel for a maximum NAC output capability of 4 amp. When paralleling two (2) outputs, bridge (pos +) to (pos +) and (neg -) to (neg -) of the selected outputs (Fig. 2, pg. 6). Both of the corresponding output switches must be set to follow the same input. Install two (2) 2.2K ohm EOL resistors in parallel across the last notification appliance.

**Note: Paralleled output circuit configuration is non-power limited.**

**Fig. 3**



### Class A hookup:

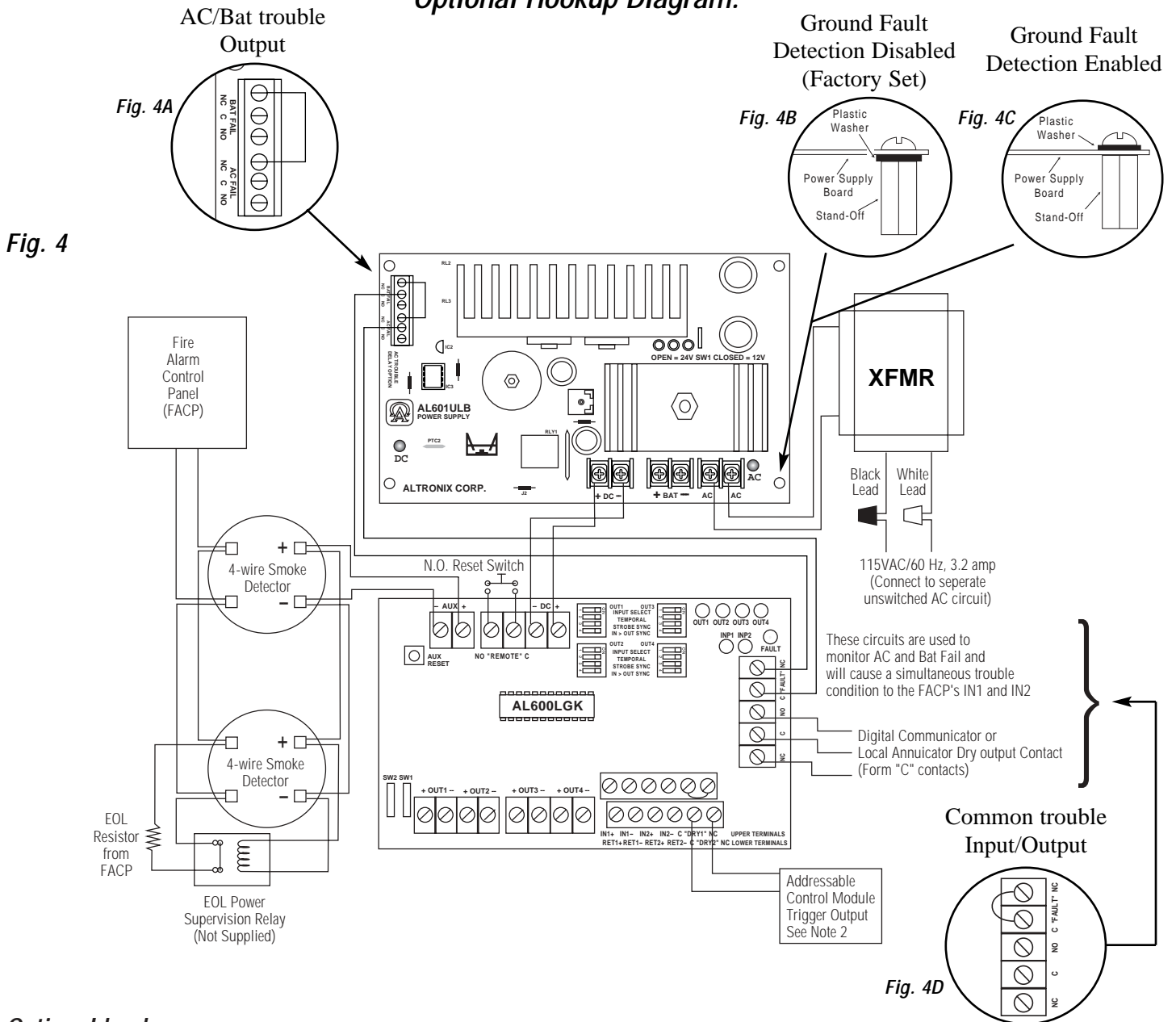
- Switches SW1 & SW2 on AL600LGK logic board must be in the closed position for proper termination of NAC. Output 1 and output 3 must be wired in parallel (pos +) to (pos +) and (neg -) to (neg -). Output 2 and output 4 must be wired in parallel (pos + to pos + and neg - to neg -). Both of the corresponding output switches must be set to follow the same 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. 4D, pg. 7).

**Note: Paralleled output circuit configuration is non-power limited.**

<b>Legend</b>	Horn	Strobes	Horn Strobes
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## Optional Hookup Diagram:



### 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. 4A) to the common trouble input.

**Note:** If common trouble input option is not used, terminal pair [C "FAULT" N.C.] (Fig. 4D) must be shorted (connect jumper) to remain inactive.

- 2- Auxiliary output (- AUX+) provides 12VDC or 24VDC at 50mA 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 [NO REMOTE C] or by pressing AUX RESET button on the AL600LGK logic board.

**Ground Fault Detect: Factory set disabled (Fig. 4B). To enable ground fault detection remove insulating washer between the board and standoff of the lower right power supply board mounting screw (Fig. 4C).**

**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.

**Enclosure Dimensions:**

15.5”H x 12”W x 4.5”D

