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Avismo™ Series Specification and Applications Guide

IL-4A & IL-12A Four Channel and Twelve Channel Lamp Controllers

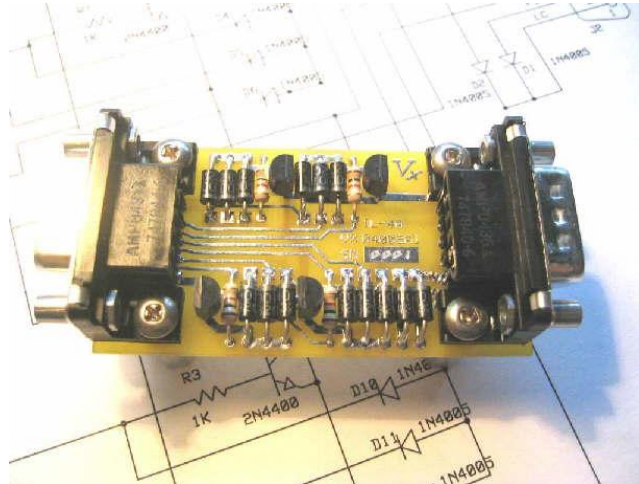


Figure 1-1. IL-4A

1. Features

- ❑ Four or twelve independent annunciator lamp drivers.
- ❑ Fully dimmable from panel dimmer bus for night operation.
- ❑ Push-to-test input for lamp integrity testing.
- ❑ Active low (switch to ground) or active high (switch to power) sense inputs.
- ❑ Two independent isolated sense inputs per lamp, configurable as two active low or one active low and one active high input.
- ❑ 3 to 15 Volts DC operation, 100 mA per lamp.
- ❑ Small footprint of 2.5" x 1.3" (63.5 x 33 mm) for the IL-4A or 2.5" x 3.8" (63.5 x 96.5 mm) for the IL-12A.

2. Description

The IL-4A and IL-12A are four-channel and twelve-channel lamp controllers for experimental aircraft or industrial applications. They allow up to eight (or 24) circuits to be monitored for a mix of active-high (switched to power) or active low (switched to ground) inputs. Two isolated inputs per channel are provided, sharing one indicator lamp. Activating either or both inputs will operate the corresponding lamp. Flexible power source inputs are provided, allowing lamp illumination control from a panel dimmer bus, or powering from redundant sources.

The IL-4A and IL-12A drive LED lamps or incandescent lamps up to 100 mA each. LED lamps require an external current limiting resistor if not already provided in the lamp assembly. A push-to-test input allows all lamps to be tested for integrity, regardless of sense polarity.

Inputs to the devices are active HIGH, active LOW, or mixtures of both. A useful function is the ability to use any channel's two inputs to sense a polarity-reversing switch, such as used for motors. For example, this allows a simple indication of flap or landing gear motor operation, independent of direction.

For the D-Sub interface, the *input* side is a female board mount connector, while the *lamp* side is a male board mount connector.

3. IL-4A Pin Descriptions (Valid for each quad of an IL-12A)

J1 Interface (female DB-9)			
Pin Number	Pin Name	Function	Connect To
1	GND	Power Ground	System electrical ground.
2	D1	Channel D input #1	Low going signal to be monitored.
3	C1	Channel C input #1	Low going signal to be monitored.
4	B1	Channel B input #1	Low going signal to be monitored.
5	A1	Channel A input #1	Low going signal to be monitored.
6	D2	Channel D input #2	High or low going signal to be monitored.
7	C2	Channel C input #2	High or low going signal to be monitored.
8	B2	Channel B input #2	High or low going signal to be monitored.
9	A2	Channel A input #2	High or low going signal to be monitored.

J2 Interface (male DB-9)			
Pin Number	Pin Name	Function	Connect To
1	X	Lamp Power Common	One side of all indicator lamps.
2	D	Lamp D output	Lamp D.
3	C	Lamp C output	Lamp C.
4	B	Lamp B output	Lamp B.
5	A	Lamp A output	Lamp A.
6	P1	Power Input #1	Primary Power input, connect to primary power.
7	P2	Power Input #2	Secondary Power input. Connect to redundant power source or panel dimmer bus.
8	PT	Push to Test switch input	Connect to one side of a momentary contact switch.
9	PG	Push To Test Switch ground	Connect to the other side of a momentary contact switch. This pin is internally connected to Power Ground.

4. Electrical Characteristics Over Specified Operating Temperature

Parameter	Symbol	Value	Units	Conditions
Power Input	V_{CC}	3 to 15	VDC	Pin P1 or P2
Maximum Steady-State Lamp Current	I_L	100	mA	Each lamp
Maximum Steady-State Input LOW current	I_{INL}	100	mA	Each active LOW input
Typical Input Resistance	R_{IN}	1	K Ω	Each active HIGH input
Maximum Steady-State Total Load Current	I_{LMAX}	400	mA	Pin P1 or P2
Maximum Transient Load Current	I_{LMAX}	1.0	A	Pin P1 or P2
Ambient Operating Temperature	T_A	-20 to +55	$^{\circ}C$	Non-Condensing
Storage Temperature	T_S	-40 to +85	$^{\circ}C$	Non-Condensing
Maximum Power Dissipation	P_D	1.0	W	Not including lamp power

5. Installation

Input programming

Important: The device input types must be programmed prior to use.

Each of the 'x2' inputs (A2, B2, C2, D2) for the IL-4A or each quad of an IL-12A needs programming to allow either LOW (input connected to ground) or HIGH (input connected to power). They are all programmed in the same way. Even if an input is not used, it must be programmed.

To enable an input to sense LOW:

Figure 5-1 shows four resistors (R1, R2, R3 and R4). If an input is active LOW, then remove the corresponding resistor by clipping the leads with a flush cutter on both ends.

R1 is for channel A,
R2 is for channel B,
R3 is for channel C and
R4 is for channel D.

Note: It also acceptable to remove the transistors (Q1...Q4) instead of removing the resistors. It is also acceptable to remove both the resistors and transistors.

To enable an input to sense HIGH:

Figure 5-1 shows several diodes. Four of them (D4, D7, D10, D13) are used for programming. If an input is to be active HIGH, then remove the corresponding diode by clipping the leads with a flush cutter on both ends.

D4 is for channel A,
D7 is for channel B,
D10 is for channel C and
D13 is for channel D.

If an input is not used:

Remove the resistor (and/or transistor), the diode, or both. Do not leave both connected, or the device will not operate correctly.

Mounting

The IL-4A and IL-12A devices allow for chassis mounting using four 4-40 screws and stand-offs.

Figure 5-1 shows the IL-4A board layout and Figure 5-2 shows the IL-12A board layout. Input connections are made on one side, and lamp output connections on the opposite side.

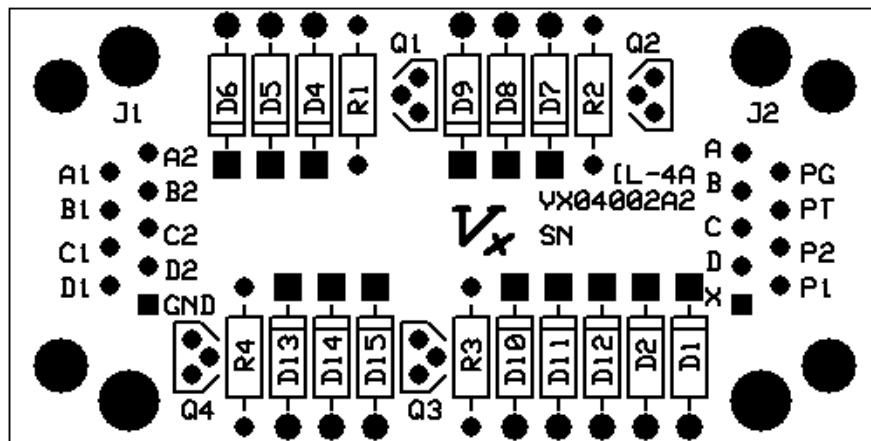


Figure 5-1. IL-4A component identification and layout.

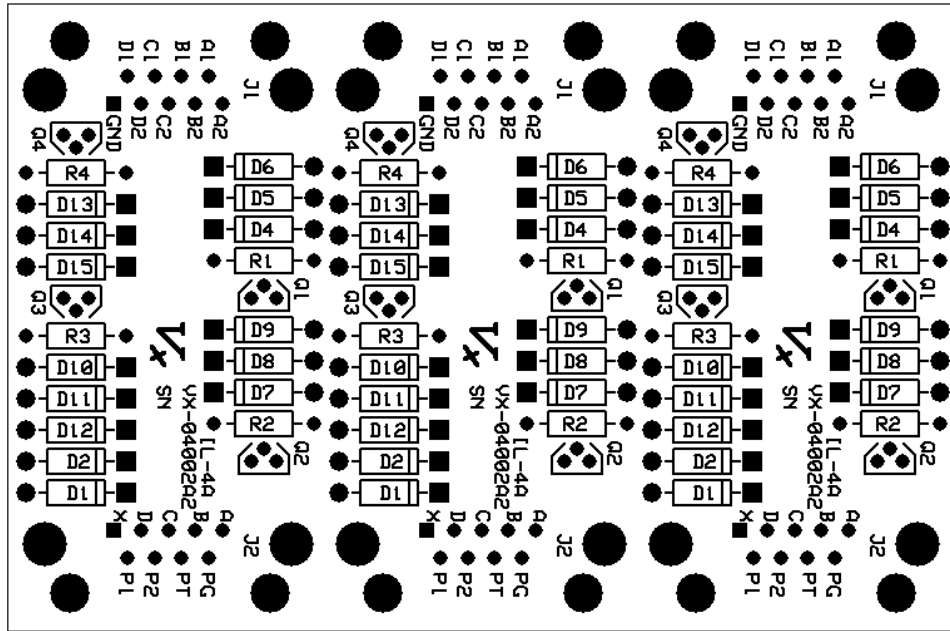


Figure 5-2. IL-12A component identification and layout.

6. Application Information

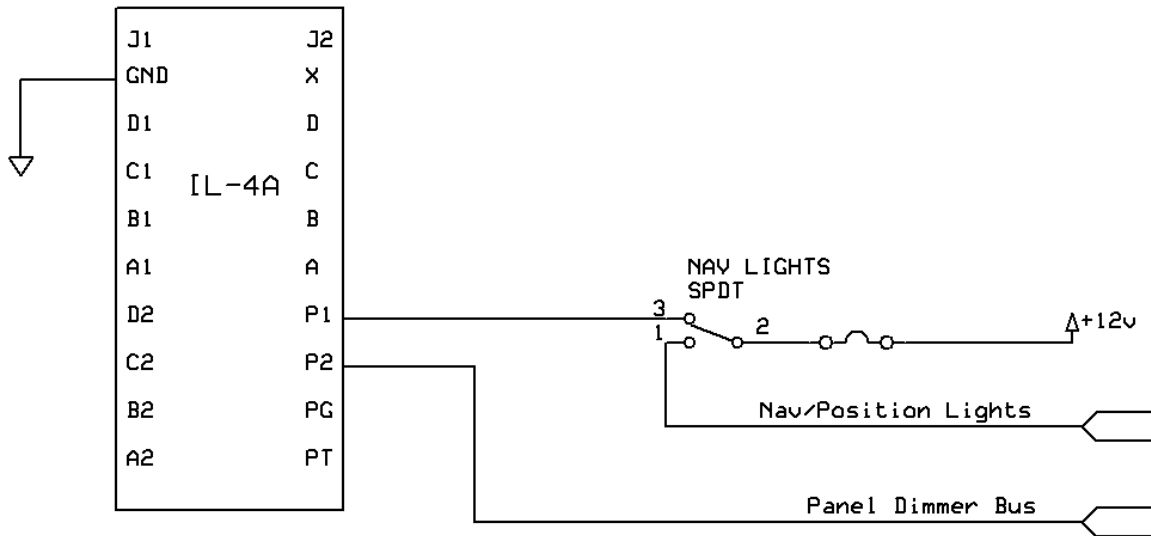


Figure 6-1. Aircraft power wiring for use with dimmer bus.

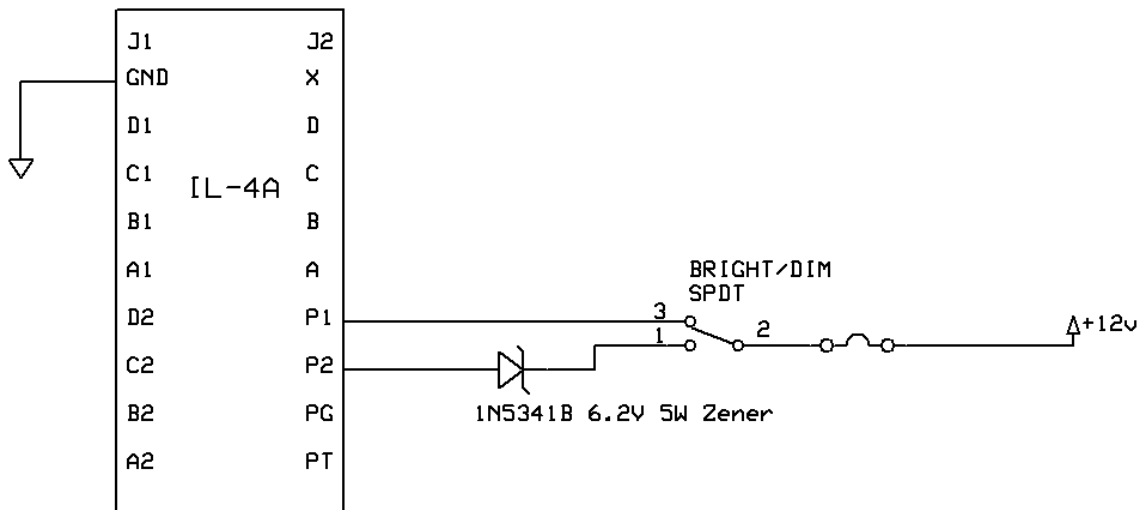


Figure 6-2. Power wiring for applications without a dimmer bus.

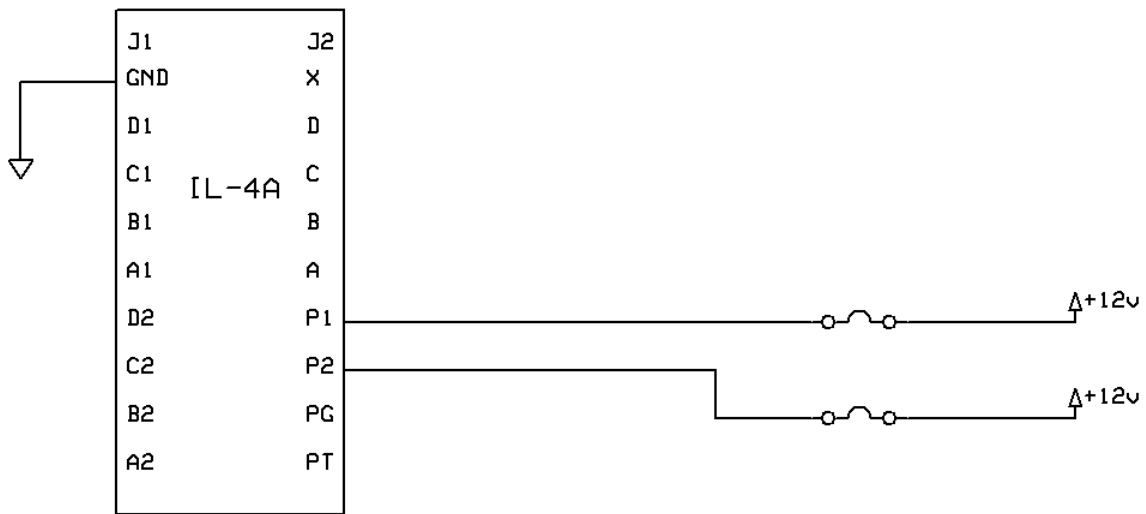


Figure 6-3. Wiring for failure-resistant redundant power.

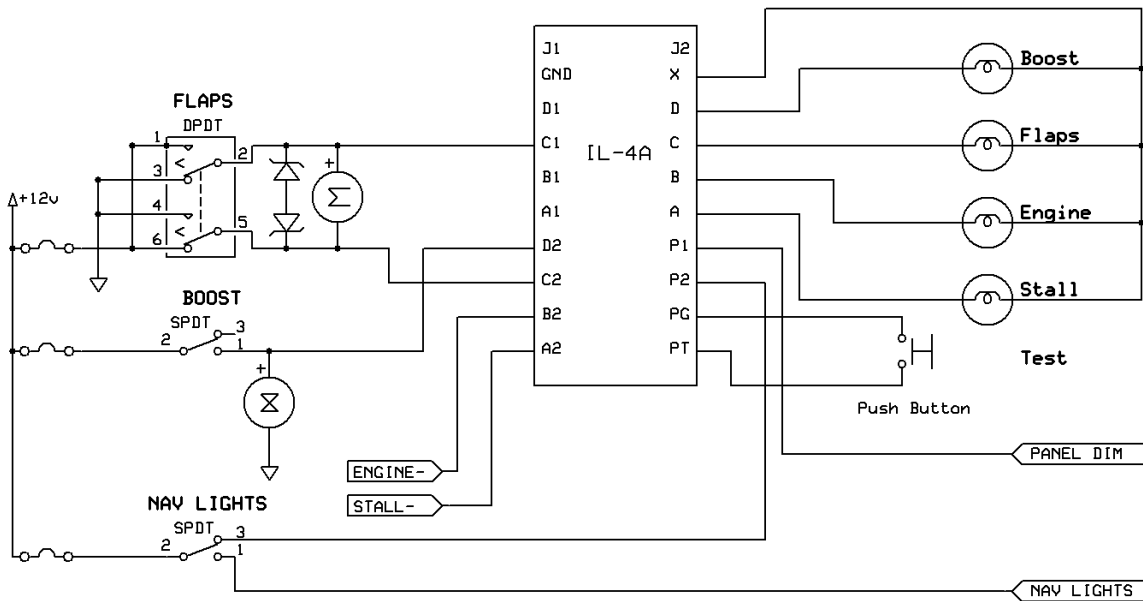


Figure 6-4. Typical aircraft installation.

Figure 6-1, Figure 6-2 and Figure 6-3 show options on power connections to the IL-4A device, which are also valid for each quad of an IL-12A device. Figure 6-4 is a typical application showing four warning indicators. In this example, the STALL- and ENGINE- inputs are active low, the FLAPS1- and FLAPS2- inputs are active low (connected to the two polarities of a flap position switch) and the BOOST input is active high.

Channels A, B and C are each configured as active LOW on both inputs and Channel D is configured as an active HIGH on input 2.

7. Ordering Information

Part Number	Description
IL-4A VX-04002xx-1-14	IL-4A 14 Volts
IL-12A VX-04002-xx-11-14	IL-12A 14 Volts

8. Warranty and Support

This product is warranted for a period of two years after date of purchase against defects in materials or workmanship. Warranty returns will be replaced with new or refurbished product at the sole discretion of Vx Aviation. Customers shall be responsible for the shipping costs of both the returned and replacement product. Under no circumstances shall Vx Aviation be responsible for damages of any kind whatsoever resulting from the use of Vx Aviation products. Total liability is limited to the purchase price of the product. Customers take sole responsibility for fitness of use, application and installation of the product. As a condition of purchase, the customer shall accept complete liability for the product and its use.

For product inquiries and support, contact Vx Aviation.

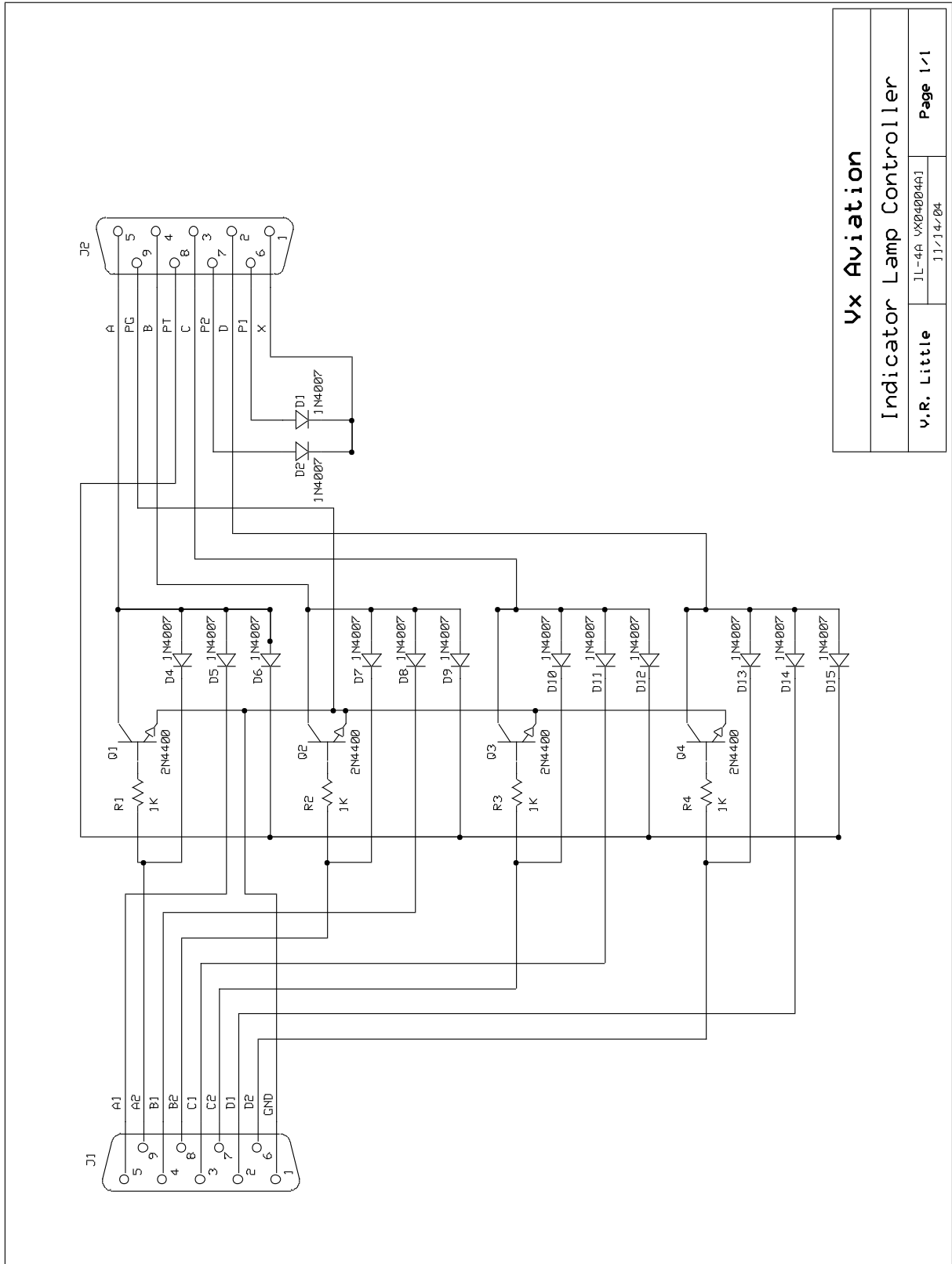
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9. Document Revision History

Issue Number	Date	Purpose
VXD-0411001A1	November 13, 2004	Initial Release reflecting A1 proto PCB design.
VXD-0411001A2	November 14, 2004	Updated to reflect A2 PCB design; editorial changes.
VXD-0411001A3	March 22, 2005	Updates to include IL-12A option.
VXD-0411001A4	December 9, 2005	Updated web link and ordering information. Removed wire tail option.
VXD-0411001A5	July 21, 2008	Editorial change to deleted text reference to previously removed figure.
VXD-0411001A6	November 24, 2008	Corrected J1 pin numbering in Section 3.



10. Device Schematic (IL-4A and each quad of an IL-12A)



Vx Aviation

Indicator Lamp Controller

V.R. Little

IL-4A VXD0404A
11/14/04

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