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Introduction

The **LIC-X256N Series** unit is a Digital Intensity Control with PWM control to drive the LED light source intensity (made by Falcon).



Safety

Please read the Manual before using or do any connection of the LIC-X256N Series. If there is any doubt, please contact us for verifications.

- Input supply for LIC-X256N series is **+12VDC to +48VDC**.
- Caution: Maximum Input voltage is **48VDC ±2%.**
- LIC-X256N series is a PWM, constant voltage source; therefore the LED must have a serial resistor to limit the current to prevent damage of the LED. The user must calculate the maximum current which taken by the led and input voltage to determine the resistor value.
- LIC-X256N is configure into 3 working modes as below
    1. Continuous Mode: Continuous turn On.
       (Lighting must **not** over drive)
    2. Trigger ON/OFF: Accepting trigger input signal to turn On and turn Off.
       (Lighting must **not** over drive)
    3. Strobe Mode : Accepting trigger input signal to strobe the lighting. (Strobe **duration** is limit to 7.5msec (by hardware) and **duty cycle** must not exceeded > **10%** to avoid damage to the lighting due to overheated or burn.)
       In Strobe mode only, over drive is possible.

LIC-X256N Series Specifications

1. **Intensity control:** 120 KHz PWM frequency and the duty cycle is an adjustable from 0-100% via (0-255 steps).

2. **External Control:** The LIC unit have the interface ability to connect to:
   - **i.** Serial Control - able to interface with the PC (COM port or RS232).
   - **ii.** IO Control - able to interface with most of the industrial input/output card with build in an opto-isolator.

3. **Enable consistent image contrast:** The image capturing (pixel consistency <3 pixels value). This will help to improve vision inspection results (to achieve higher accuracy typically in gauging, blob analysis and PRS system).

4. **Protection:** There are two protection circuitry designs in for LIC series.
   - **i.** **High Side-** An Internal circuit cut off the current if the positive short circuit to external ground**.** Current will restore back to normal if short circuit is release to normal condition.
   - **ii.** **Low Side-** An Internal circuit limits the current if the load is short circuit.

5. **Driver:** High power MOSFET is used to drive the output and guarantee to have long operating hours (100,000).

6. **Intensity Linearity:** The intensity is set by digitally (soft touch switch from the panel or control through the RS232). Therefore, the output current is linear and each of the step is:

   - **i.** **256 Steps –** 0.39%/step (0-100% intensity).

7. **Power Input Voltage Requirement:**
   7.1 Power Input Voltage
   The LIC-X256N taken **input +12VDC to +48VDC** only.



Factory Default Setting, JP 5 at +V1	
Pins	**Descriptions**
+V1	Supply for Channel **1**, **3** and the controller
+V2	Supply for Channel **2**, **4** only
Com /Ground	Ground for the controller

Option Setting, JP 5 at +V2	
Pins	**Descriptions**
+V1	Supply for Controller Only
+V2	Supply for Channel **1**, **2**, **3**, **4**
Com /Ground	Ground for the controller

7.2 Maximum Input voltage for +5VDC, +12VDC and +24VDC lightings.

Below table shown a selection of VDC input for +12V or +24VDC lighting in all 3 working modes.

A. Voltage input for +12VDC Lighting (**JP 5** at **+V1**)

Operating Mode	**+ V1 Input** (Channel 1, 3)	**+V2 Input** (Channel 2, 4)
1. Continuous	+12VDC (MAX)	+12VDC (MAX)
2. Trigger ON/OFF	+12VDC (MAX)	+12VDC (MAX)
3. Strobe	+15VDC to +24VDC (Over Drive, DutyCycle<10%)	+15VDC to +24VDC (Over Drive, DutyCycle<10%)

B. Voltage input for +24VDC Lighting (**JP 5** at **+V1**)

Operating Mode	**+ V1 Input** (Channel 1, 3)	**+V2 Input** (Channel 2, 4)
1. Continuous	+24VDC (MAX)	+24VDC (MAX)
2. Trigger ON/OFF	+24VDC (MAX)	+24VDC (MAX)
3. Strobe	+24VDC to +48VDC Recommended at +36VDC (Over Drive, DutyCycle<10%)	+24VDC to +48VDC Recommended at +36VDC (Over Drive, DutyCycle<10%)

C. Voltage input for +5VDC Lighting (**JP 5** at **+V2**)

Operating Mode	**+ V1 Input** (Controller Only)	**+V2 Input** (Channel 1,2,3,4)
1. Continuous	+12VDC to +24VDC	+5VDC (MAX)
2. Trigger ON/OFF	+12VDC to +24VDC	+5VDC (MAX)
3. Strobe	+12VDC to +24VDC	+5VDC to +12VDC (Over Drive, DutyCycle<10%)

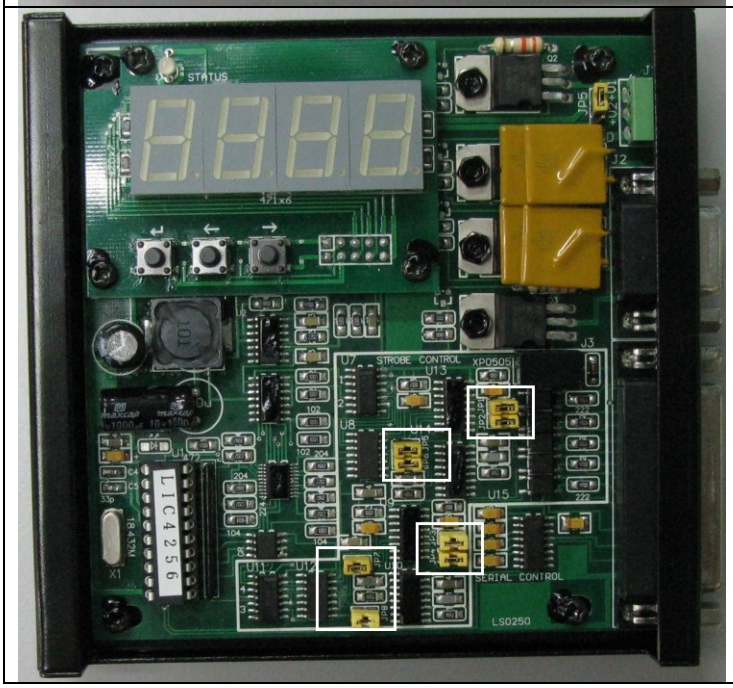
8. Power Dissipation: The LIC-X256N series is able to drive up to maximum output of 40W per Channel. But when the LIC-X256N series is driving to maximum power rating, a significant heat will be generated from the driver and heat up the case. The user must ensure the LIC case have a proper heat dissipation to release heat.

Important: In continuous mode, please make sure the Power Input voltage supply is correct for the +5V +12V or +24V lighting.

9. Jumper Setting for different Operation Mode

Factory Default Setting, All jumper are in **Open** position.

	JP1	JP2	JP3	JP4	JP5	JP6	JP7	JP8
Continuous Mode	**Open**	**Open**	**Open**	**Open**	**Open**	**Open**	**Open**	**Open**
Trigger OFF/ON	**Open**	**Open**	**Open**	**Open**	**Open**	**Open**	**Open**	**Open**
Strobe Mode	**Short**	**Short**	**Short**	**Short**	**Short**	**Short**	**Short**	**Short**

	For Continuous mode and Trigger ON/OFF, all jumper JP 1 to JP 8 need setting to be in position of **open**.
	For Strobe Mode, all jumper JP 1 to JP 8 setting need to be in position of **short**.

10. Connector Configuration- Output to Lighting

Table 1.0 shows the pin configuration for Lighting Channel 1, 2, 3, 4. And circuit diagram in Figure 1.0 shows the connection for Lighting to the LIC-X256N.

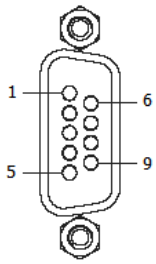
DB-9 pin Female	Pin	Signals Name	Pin	Signals Name
	1	+ CH1	6	- CH1
	2	+ CH2	7	- CH2
	3	+ CH3	8	- CH3
	4	+ CH4	9	- CH4
	5	N.C.		

Table 1.0

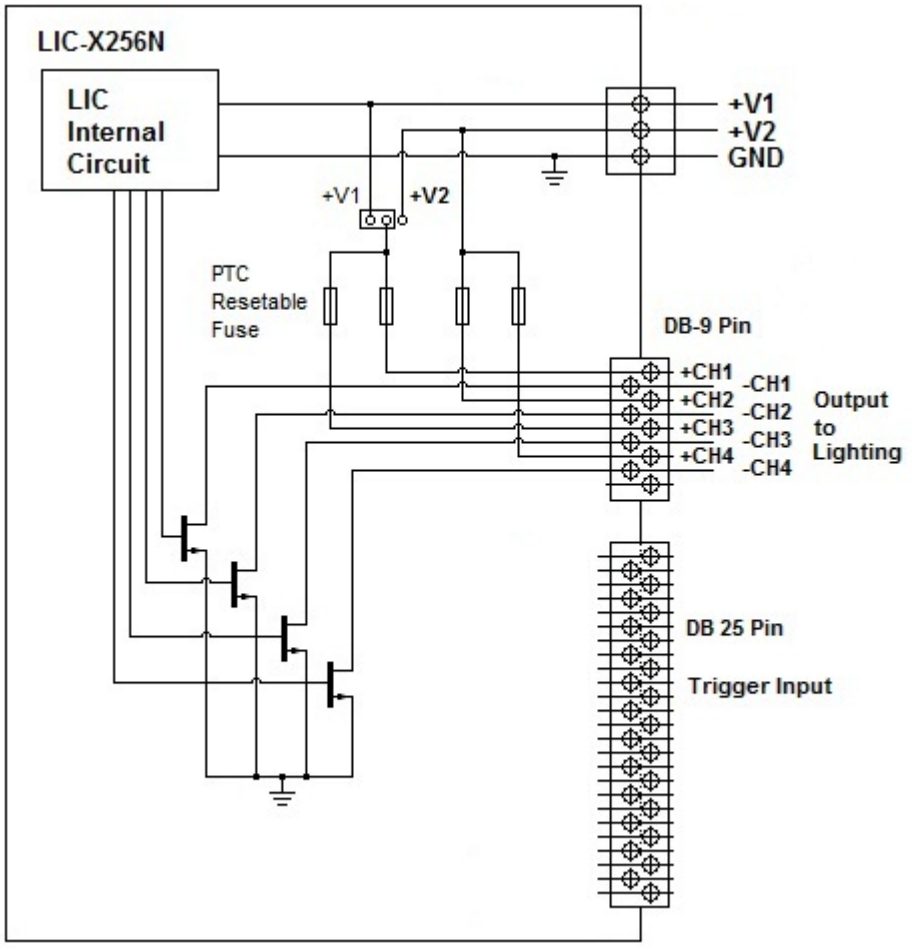
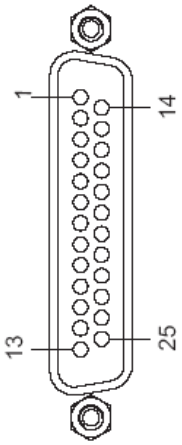


Figure 1.0

11. Connector Configuration- Trigger Input

Table 2.0 shows the pin configuration for the trigger input for Channel 1, 2, 3, 4.



DB-25 pin Female
Table 2.0

Pin	Signals Name	Pin	Signals Name
1	+Viso(5 VDC) /Output	14	+Viso(5 VDC) /Output
2	Trigger L1+ / Input +5V	15	Trigger L1+ / Input +24V
3	Trigger L1 - / Input Gnd	16	Trigger L1 - / Input Gnd
4	Trigger L2+ / Input +5V	17	Trigger L2+ / Input +24V
5	Trigger L2 - / Input Gnd	18	Trigger L2 - / Input Gnd
6	Trigger L3+ / Input +5V	19	Trigger L3+ / Input +24V
7	Trigger L3 - / Input Gnd	20	Trigger L3 - / Input Gnd
8	Trigger L4+ / Input +5V	21	Trigger L4+ / Input +24V
9	Trigger L4 - / Input Gnd	22	Trigger L4 - / Input Gnd
10	Gnd iso. / Output	23	Ext Trigger Enable +/ Input +24V
11	RX (See figure 10)	24	Ext Trigger Enable +/ Input +5V
12	TX (See figure 10)	25	Ext Trigger Enable - / Input Gnd
13	Gnd **		

** This ground should not use for trigger signals. Only use for PC Serial port connection.

12. Connection in different operation mode

i. Continuous mode

Figure 2.0 shows the connection diagram for continuous mode.

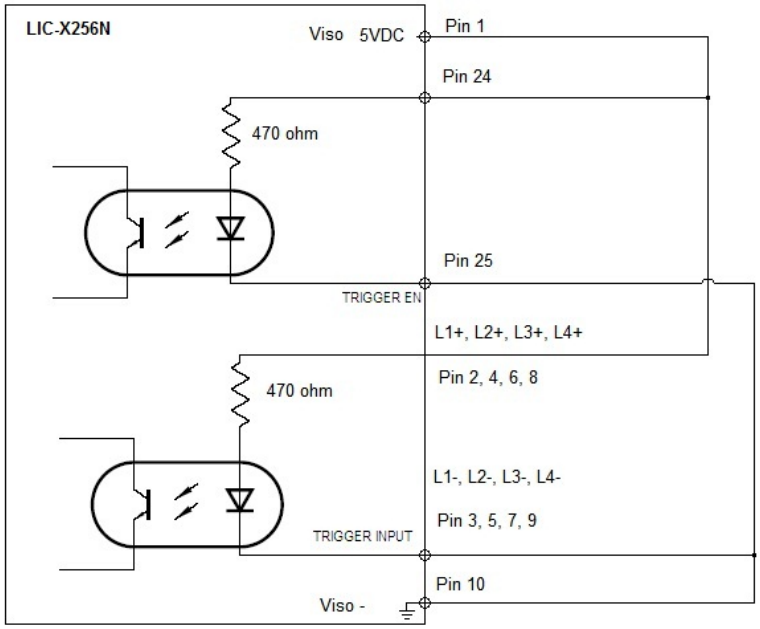


Figure 2.0

ii. Trigger ON/OFF

Figure 3.0 shows connection diagram for the trigger On/OFF with **+5V** signal with a NPN transistor or driver.

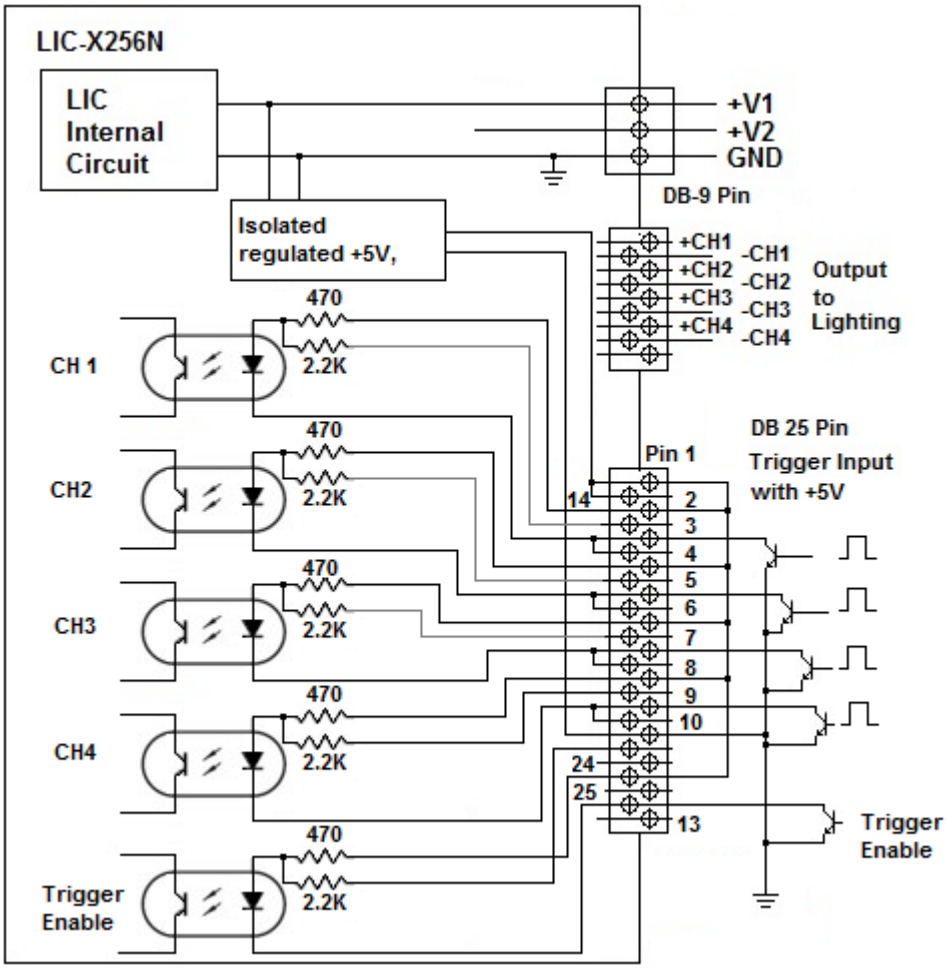


Figure 3.0

Figure 3.1 shows connection diagram for the trigger On/OFF with **+5V** signal with a PNP transistor or driver.

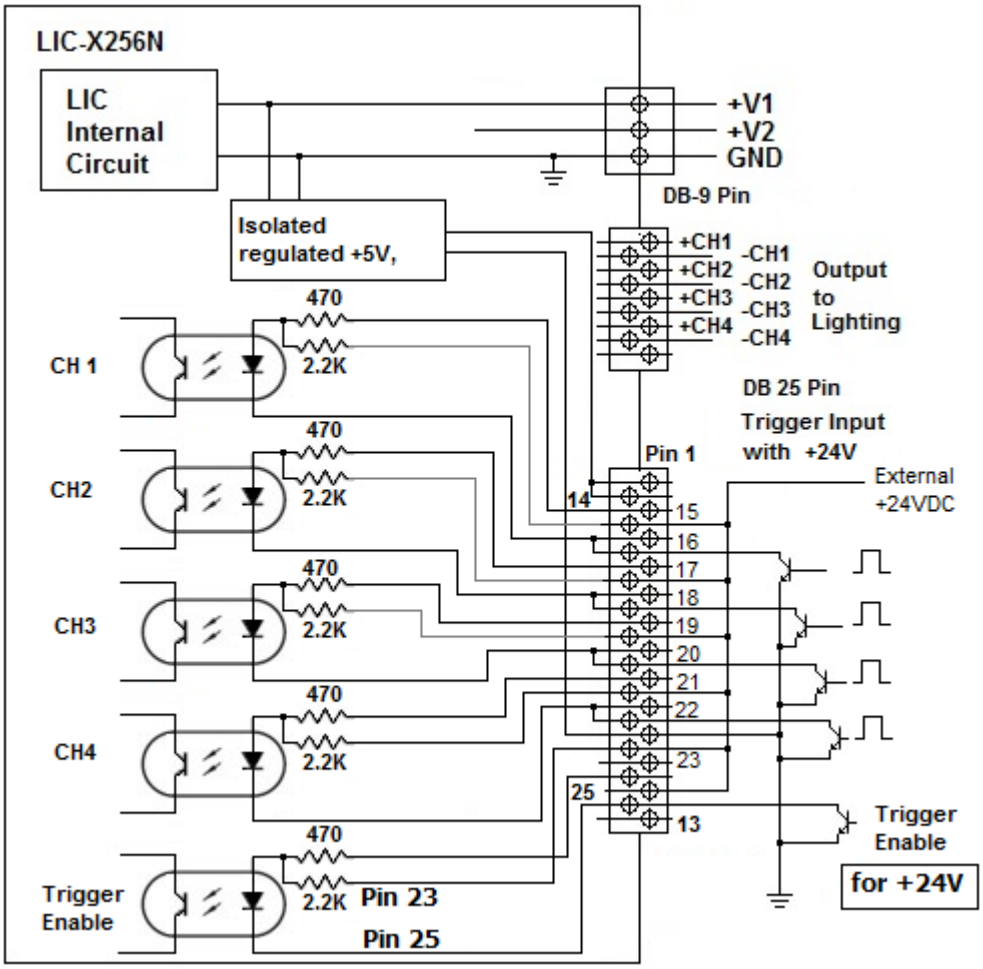


Figure 3.1

Figure 3.2 shows connection diagram for the trigger On/OFF with **+24V** signal with a NPN transistor or driver.

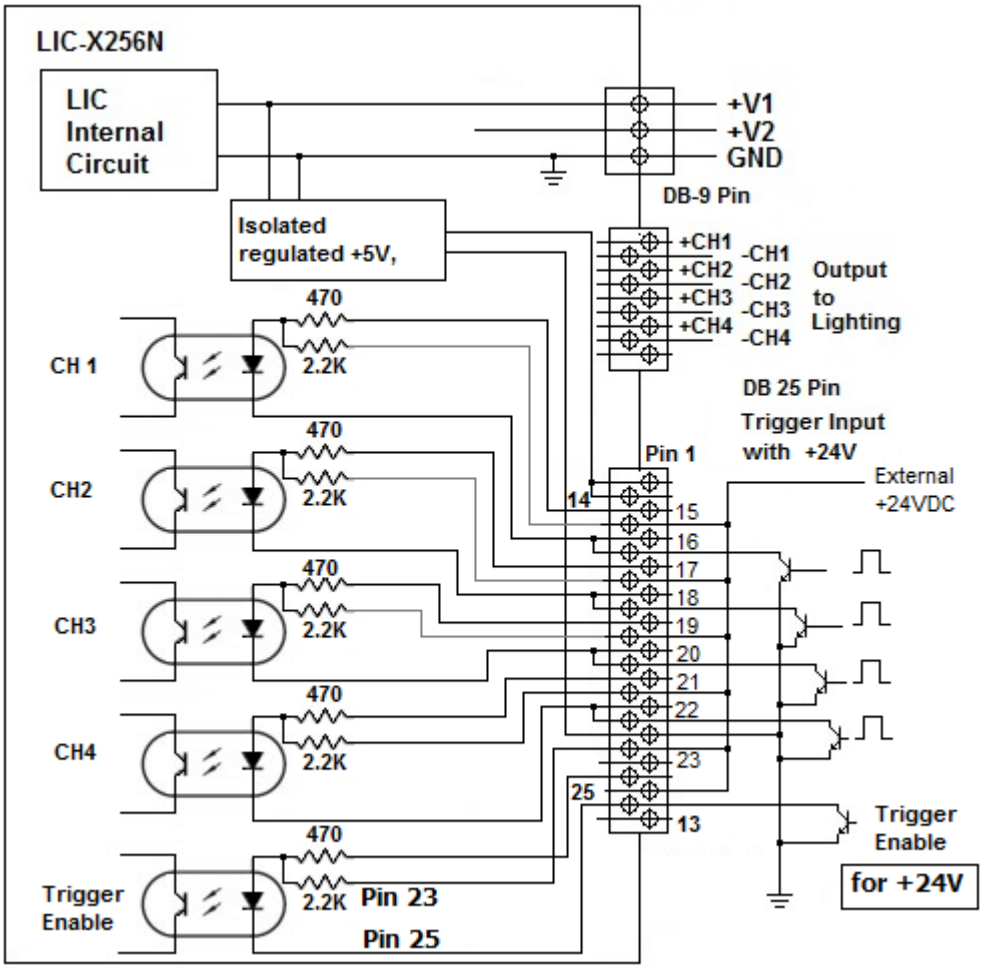


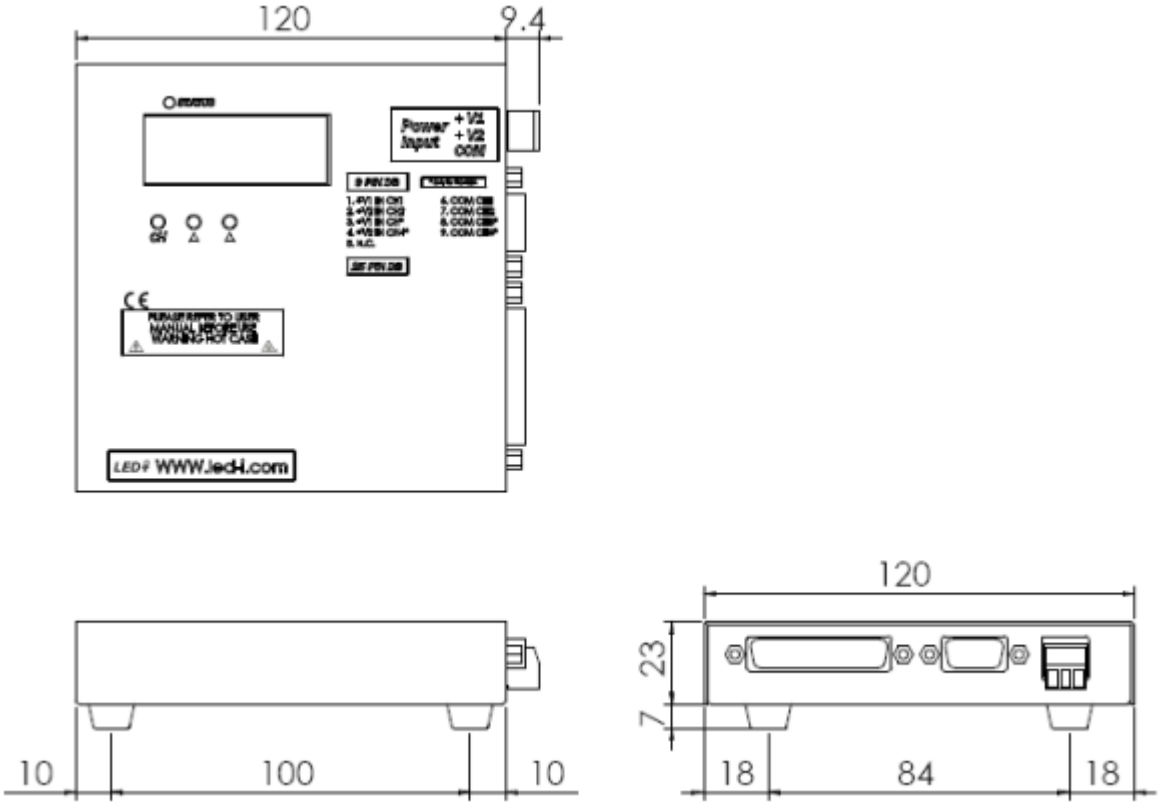
Figure 3.2

iii. Strobe Mode

In strobe mode the ON time for the lighting is limit by the LIC hardware as 7.5msec. The trigger signal input is same as Trigger ON/OFF as Figure 3.0, 3.1 and 3.2.

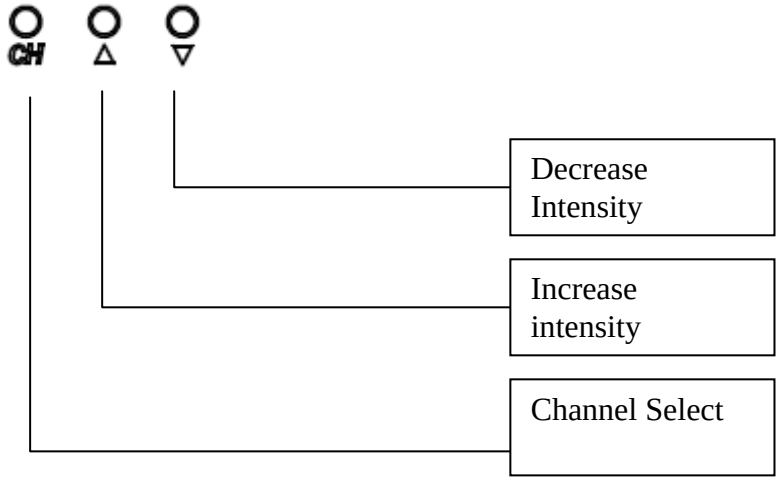
Important Note: **Duty Cycle** must be less than <10% to avoid the lighting damage in over current.

13. Mechanical Dimension



All dimension area in mm.

14. Intensity Setting:



Serial Port Control
The LIC is able to control thru serial communication.

12.1 Power Up
LIC unit will send 3AH thru TX to PC to indicate LIC-X256 unit has ready to receive the control data from PC.

12.2 Data Protocol for setting the intensity.
Two byte is required to send to LIC-4256/LIC-2256. The first byte is the LIC signature code and the second byte is indicates the intensity. For example:
Example:
Software Control

Byte 1								Byte 2							
1	0	1	P	FB	X	L1	L0	D7	D6	D5	D4	D3	D2	D1	D0

Intensity Data
(D0-D7)
256 steps intensity
for LIC-X256

Channel Select
Channel 1 – L0=0, L1=0
Channel 2 – L0=1, L1=0
Channel 3 – L0=0, L1=1
Channel 4 – L0=1, L1=1

Enable Feedback from LIC
FB=0 – Turn off feedback
FB=1 – Turn ON feedback from LIC
(controller send back 1 byte on the received intensity value)

Manual/ Software Control Logic
P=0 - Pannel switch control
P=1 - Software control from computer.

For old version of LIC, please ignore the FB bit, and it should set with a logic '0'.

Disclaimer

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