

For a List of Compatible Dimming Systems:
i2Systems.com/Lightlink

LIGHTLINK™

LED A/D Dimming Module
LL-105 Setup Guide

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i2Systems®
ADVANCED LED LIGHTING

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WELCOME

Thank you for purchasing an i2Systems LightLink. To get started, we recommend the following:

- Review the entire Setup Guide to learn the full power of what your LightLink is capable of.
- Carefully follow the step-by-step instructions in the following pages to set up and wire your i2Systems LightLink device.

CONTENTS

Please take note of the following components included in the box:

- (1) LightLink A/D Dimming Module, Model LL-105



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CONTENTS CONTINUED

- (1) 2-position terminal block
- (1) 3-position terminal block
- (1) 6-position terminal block with Jumper
- (1) Orange Selector, P/N 9120200-36
- (1) Blue Selector, P/N 9120200-14
- (1) Screwdriver
- (2) Mounting Screws

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CAUTION

Wiring with power on may result in personal injury. Damage to this product caused by wiring with power on voids warranty. Make all connections prior to applying power. Read all instructions prior to installation.

To reduce the risk of fire, burns, or injury, use lights only in the manner intended by i2Systems. Should you have questions regarding your installation, please contact i2Systems before applying power. Product should be installed by a licensed electrician.



This device has been tested and found to comply with Part 15, Class B, of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

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PLEASE

- When installing or servicing the LightLink, be sure to disconnect the circuit prior to beginning work. Care must be provided when making connections.
- Proper safety equipment including eye protection should be worn, and proper safety precautions should be taken.
- Connect to a properly grounded branch circuit protected by a circuit breaker or fuse.
- Never wire the LightLink directly to a battery or unprotected power source.
- Always use i2Systems and/or i2Systems recommended electrical components.
- Never leave exposed wiring without using a suitable wire nut or connector when making a connection to an electrical circuit.
- Never exceed the maximum voltage ratings. Failure to comply will damage the LightLink.
- For use on systems with voltages greater than the maximum rated voltage, use a safety agency approved, CE marked step down power supply to convert the higher voltage to a voltage within the specified operating range of the fixture.
- Dry location use only. Never submerge the LightLink module in any liquid or where liquid will collect, pool, or puddle.
- Wiring must be rated for +105°C or higher. Minimum wire size is .75 mm² (18 awg).

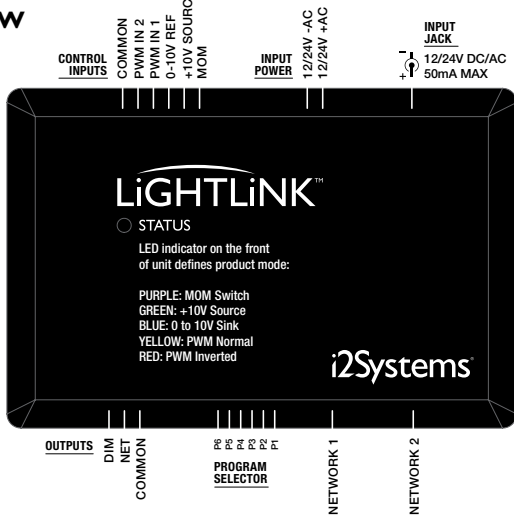
Questions? Contact i2Systems:

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TOP DOWN VIEW

If LightLink has been secured and the bottom label is no longer visible, use this chart to locate the proper connection points.

NOTE:
Network 1 & 2 are not used in A/D version of LightLink.



LIGHTLINK POWER INPUTS

PARAMETER	NOTES	MIN	TYP	MAX	UNITS
Absolute Maximum Ratings					
Input Voltage (DC)	Continuous	0		40	VdcInput
Input Voltage (AC, 60hz)	Continuous	0		28	Vac
Input Current				50	mAdc
Operating Ambient Temperature		-20		50	°C
Storage Ambient Temperature		-20		70	°C
Input Characteristics					
Operating Input Voltage (DC)		11	12/24	36	Vdc
Operating Input Voltage (AC)		10	12/24	24	Vac
Input No Load Current			20		mAdc

Conditions:
TA = 25°C
Load = Maximum Load
Cooling: Convection
Vin = 24Vdc

CONNECTIONS: Two (2) methods of connection are provided.

HARDWARE (preferred)

- DC Source: Connect +DC to **12/24v +AC** | Connect DC Common to **12/24V -AC**
- AC Source: Same as DC Source, however no polarity requirement.

WALL PLUG POWER SUPPLY (optional)

- Connect a mating connector to the designated Input Jack.
- DC Source: Connect +DC to Center Pin | Connect DC Common to Connector Barrel
- AC Source: Same as DC Source, however no polarity requirement.

Never connect 12/24V +AC, 12/24V -AC, and input jack simultaneously. Damage will occur.

LIGHTLINK CONTROL INPUTS

LightLink control inputs meet controllable ballast standards as specified in IEC 60929:2006 Annex E where specified.

NOTE ON INITIAL SETUP:

Upon power up, regardless of the available inputs, the LightLink will enter the +10V source mode.

TO ENTER INPUT DISCOVERY MODE:

In the case where +10V source mode is not the desirable input, install the supplied jumper connector to +10V Source and Common prior to power up. This connection will enter the product into **Input Discovery Mode**.

STATUS LED INDICATOR CYCLING COLORS:

Product has yet to discover an input. Should an input be connected and active upon power up, the LightLink will immediately enter a static color mode.

STATIC COLOR:

Product has identified a valid input.

INPUT MODE CONNECTED	COLOR OF STATUS LED	IEC 60929:2006 COMPLIANT
Momentary Contact (MOM)	Purple	N/A
+10V Source	Green	•
0 to 10V Sink (0-10 Ref)	Blue	•
PWM Normal (PWM In 1)	Yellow	•
PWM Inverted (PWM In 2)	Red	•

NOTE: To reenter **Input Discovery Mode**, disconnect power and control inputs from the LightLink, then reconnect and power on.

LIGHTLINK CONTROL INPUTS: MOMENTARY SWITCH DIMMING

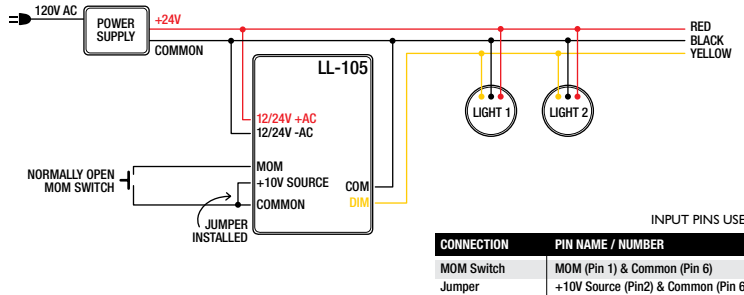
STATUS INDICATOR: ● Purple

WIRING: Connect a Normally Open (NO), Momentary (MOM) switch or contact between positions

MOM (Pin 1) and **Common** (Pin 6). Connect provided Jumper to +10V Source (Pin 2) and Common (Pin 1).

OPERATION: Press and hold Momentary switch to initiate dimming cycle. Dimming cycle continues to dim as long as switch is engaged, ranging from 100% to approximately 5% intensity, holding 2 seconds at each position before dimming the opposite direction. Briefly press and release Momentary switch for on/off operation. Non-Linear Dimming.

Example:

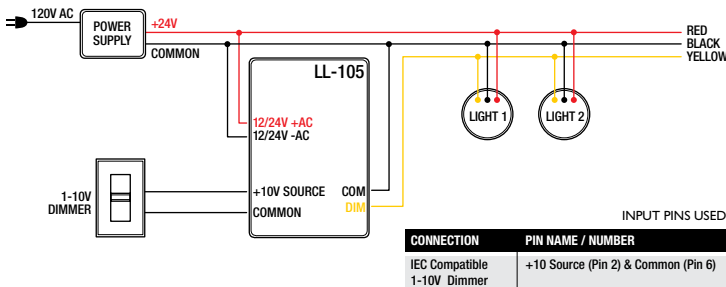


LIGHTLINK CONTROL INPUTS: +10V SOURCE

STATUS INDICATOR: ● Green

WIRING: Connect only to an IEC 60929 Annex E compatible 1-10V analog dimmer / dimming panel. +10V (typically purple) connects to +10V Source (Pin 2). Common (typically grey) connects to Common (pin 6). Typical LightLink Source current is 500uA or less. In this mode of operation, the LightLink will Source to the dimmer / control unit 10VDC and functions similar to a traditional fluorescent dimming ballast.

OPERATION: Dimming occurs between 1 and 10VDC. 10VDC provides 100% intensity. 1VDC provides 0% intensity. Linear Dimming. Example:

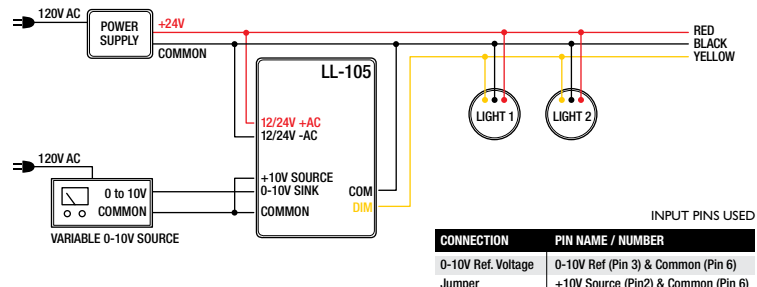


LIGHTLINK CONTROL INPUTS: +10V SINK

STATUS INDICATOR: ● Blue

WIRING: Connect a 0 to +10V DC control signal to 0-10V Ref (Pin 3). The associated DC control common connects to Common (Pin 6). In this mode of operation, the LightLink will Sink to the dimmer / control unit up to 10VDC, in which case the dimmer / control unit will need to supply 0 to 10VDC to the LightLink to reference.

OPERATION: Dimming occurs between 1 and 10VDC. 10VDC provides 100% intensity. 1VDC provides 0% intensity. Linear Dimming. Example:



LIGHTLINK CONTROL INPUTS:

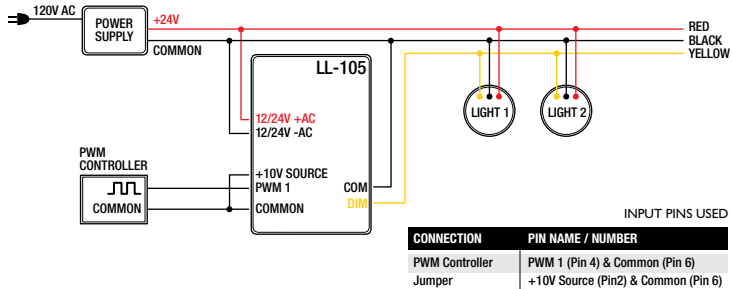
PWM NORMAL

STATUS INDICATOR: ● Yellow

WIRING: Connect only to an IEC 60929 Annex E compatible PWM dimmer / dimming panel. +PWM connects to **PWM In 1** (Pin 4) and Common connects to **Common** (Pin 6). Normal Operation PWM input voltage shall not exceed 22VDC.

OPERATION: Dimming is directly related to the PWM duty cycle. 100% duty cycle provides 100% intensity, 0% duty cycle provides 0% intensity. Linear Dimming.

Example:



LIGHTLINK CONTROL INPUTS:

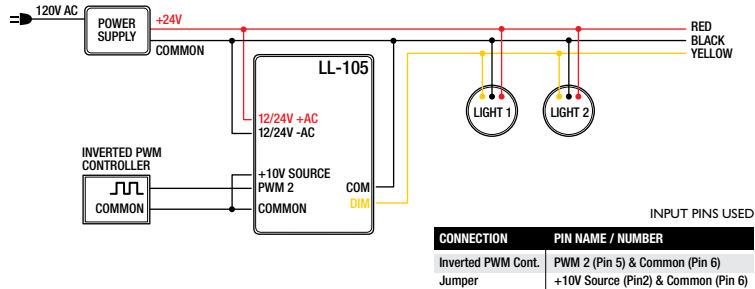
PWM INVERT

STATUS INDICATOR: ● Red

WIRING: Connect only to an IEC 60929 Annex E compatible PWM dimmer / control unit. +PWM connects to **PWM In 2** (Pin 5) and Common connects to **Common** (Pin 6). Normal Operation PWM input voltage shall not exceed 22VDC.

OPERATION: Dimming is directly related to the PWM duty cycle. 0% duty cycle provides 100% intensity, 100% duty cycle provides 0% intensity. Linear Dimming.

Example:

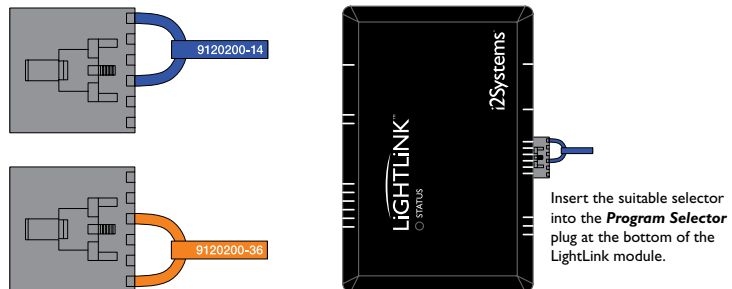


LIGHTLINK PROGRAM SELECTOR

LightLink Program Selectors promote further flexibility of the LightLink product by offering user selectable modes.

BLUE SELECTOR: Insert the Blue Selector, p/n 9120200-14 for use with V-Line Gen 2 Series and SmartDriver VSD based products.

ORANGE SELECTOR: Insert the Orange Selector, p/n 9120200-36 for use with the V-Line Element.



LIGHTLINK OUTPUTS

LightLink provides simple dimming integration to i2Systems and i2Systems enabled LED products. Definition of Pins:

DIM: DIM (Pin 1) output provides an analog control signal for use with dimmable i2Systems and i2Systems enabled products including:

- Apeiron Series (dim up to 50 lights per LightLink)
- V-Line Gen 2 Series (dim up to 50 feet of product per LightLink)
- V-Line Latitude Series (dim up to 50 feet of product per LightLink)
- V-Line Element Series (dim up to 20 feet of product per LightLink)
- SmartDriver VSD Series (dim up to 50 drivers per LightLink)

NET: NET (Pin 2) output should not be connected.

COMMON: COMMON (Pin 3) provides a common reference to **NET** (Pin 2) and **DIM** (Pin 1).

Common examples are shown on the following pages.

INSTALLATION RECOMMENDATIONS

Power Supply Selection:

i2Systems recommends the use of UL Class II Rated Power Supplies / Transformers. Power Supplies / Transformers used should be properly rated based on Load and Ambient Operating Temperatures. Use one or multiple LightLinks per power supply. Do not use one LightLink to dim products installed to multiple power supplies.

LightLink Placement:

i2Systems recommends installing LightLink products in close proximity to the i2Systems / i2Systems enabled LED products connected to the LightLink output. The LightLink should be installed such that it is serviceable and accessible for system troubleshooting as required.

Powering LightLink:

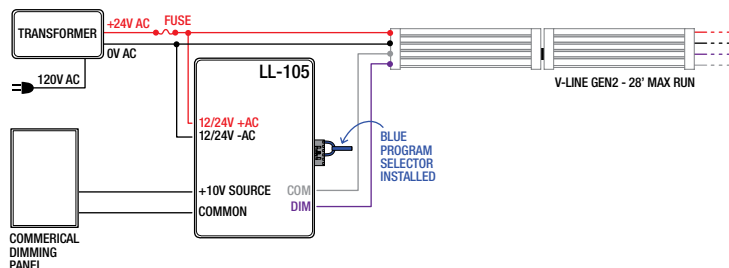
i2Systems recommends powering the LightLink off of a non-switched power feed such that the LightLink remains powered under all lighting conditions. Switching the LightLink on and off with the lighting load may result in undesirable visual effects including light flashing with power on and power off.

Wire Selection:

- Input Power / Control Input:
Recommended wire type is stranded 18awg wire with a 105°C rating.

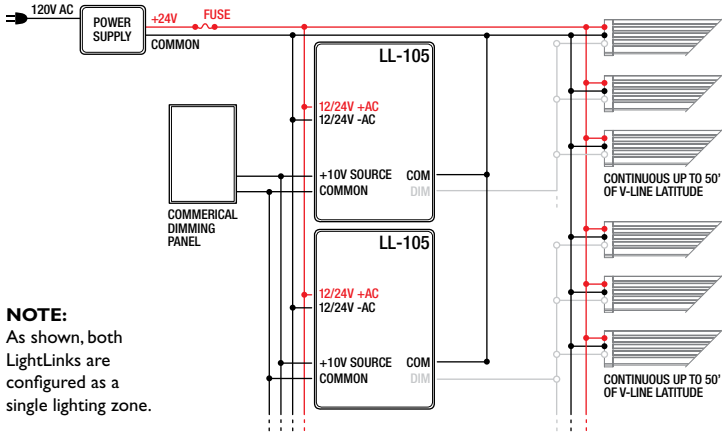
- Output:
i2Systems recommends twisting the **DIM** wire (Pin 1) and **COMMON** (Pin 3). Recommended wire type is stranded 18awg wire with a 105°C rating.

INSTALLATION EXAMPLE: V-LINE GEN2, 1-10V DIMMING CONTROL

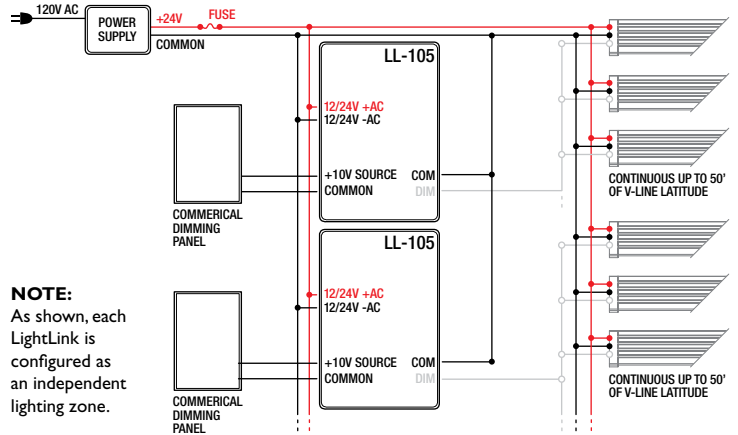


NOTE: Use of Blue Program Selector: P/N 9120200-14

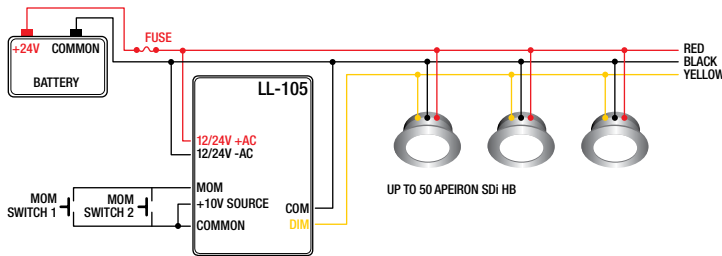
INSTALLATION EXAMPLE: V-LINE LATITUDE, 1-10V DIMMING CONTROL, 2 LIGHTLINKS, 1 DIMMER INTERFACE



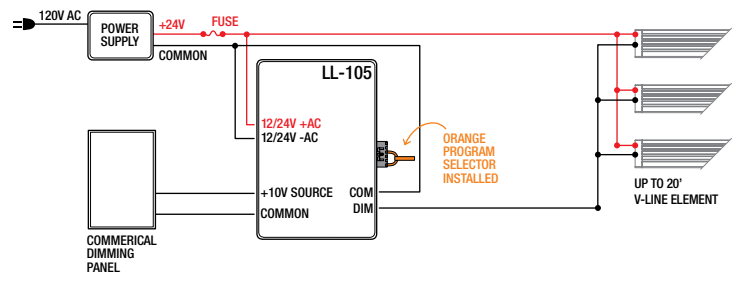
INSTALLATION EXAMPLE: V-LINE LATITUDE, 1-10V DIMMING CONTROL, 2 LIGHTLINKS, 2 DIMMER INTERFACES



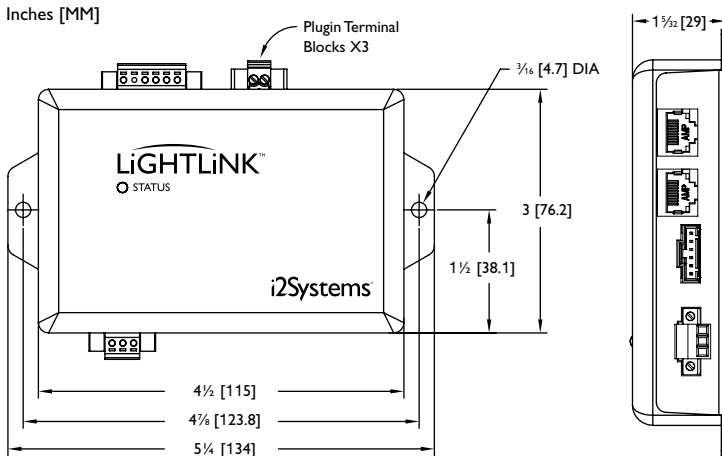
INSTALLATION EXAMPLE: APEIRON SDi HB, MOMENTARY SWITCH DIMMING



INSTALLATION EXAMPLE: V-LINE ELEMENT, 1-10V DIMMING CONTROL



DIMENSIONS



WARRANTY

i2Systems warrants that the product is free from defects in material or workmanship under normal operation. i2Systems' standard warranty is 12 months from the date of shipment to the customer. Any replacement parts furnished at no cost to the customer in fulfillment of this warranty are warranted only for the unexpired portion of the original warranty. Any services or repair outside the scope of this limited warranty shall be at i2Systems' rates and terms then in effect.

i2SYSTEMS WILL NOT BE LIABLE FOR ANY DAMAGE, LOSS, COST OR EXPENSE FOR BREACH OF WARRANTY EXCEPT AS DESCRIBED ABOVE. i2SYSTEMS' LIABILITY SHALL BE LIMITED TO REPAIRING OR REPLACING DEFECTIVE PRODUCTS ONLY AND SHALL NOT BE LIABLE FOR COSTS ASSOCIATED WITH REPLACING DEFECTIVE PRODUCT.

Normal "Wear and Tear" as determined by i2Systems is NOT covered by this warranty. For units returned in warranty and determined to be customer responsibility, i2Systems customer service will notify the customer. i2Systems is not responsible for damages outside our control including, but not limited to, physical damage, modifications to the product, or improper packaging. If product to be repaired was purchased from a dealer, distributor, or reseller, the product must be returned to the seller.

Additional warranty and returns information is available at i2Systems.com