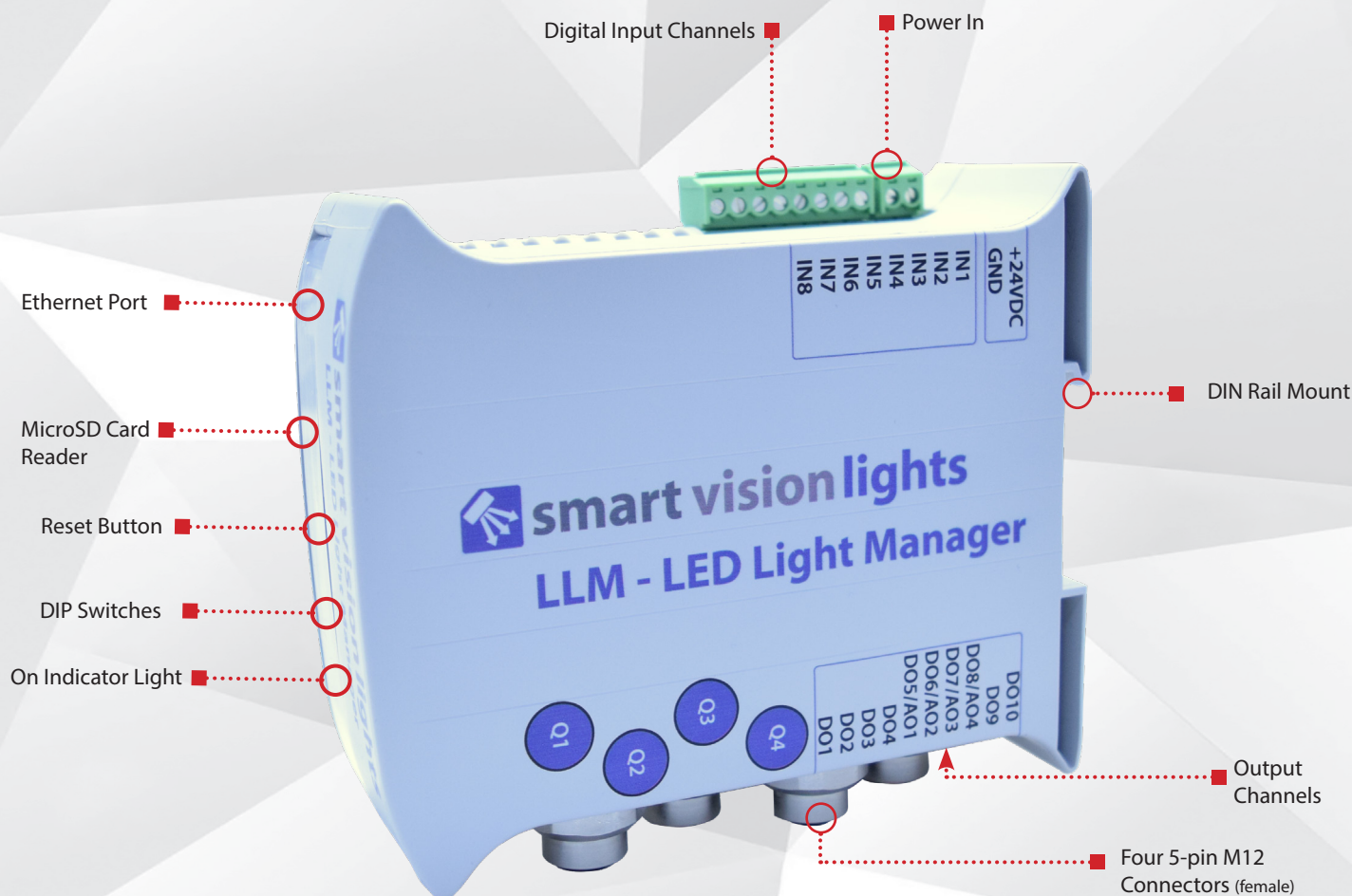


P R O D U C T D A T A S H E E T



Warranty
3
YEAR

Mount
DIN
RAIL

Compliant
CE
RoHS

UPTO
4
LIGHTS

Connector
5-PIN
M12

PRODUCT HIGHLIGHTS

- ✓ Manage multiple lights operating in Continuous, Multi-Drive™, or OverDrive™ modes
- ✓ Program operational mode, input events, and intensity through an intuitive browser interface
- ✓ Connect up to four separate lights or 1 four-zone light
- ✓ Easily program the LLM-OEM using the web page interface
- ✓ PNP and NPN selectable input channels



PRODUCT SPECIFICATIONS

Electrical Input	24VDC +/- 5%
Electrical Input Connector	2 position screw terminal block – 14 AWG max wire size
Operating Current (No Load)	70 mA
Number of Input Channels	8 (including 1 input channel with interrupt capability) *Using 4 channels in current version
Input Connector	8 position screw terminal block – 14 AWG max wire size
Max Input Channel Voltage	Not to exceed electrical input voltage
On / Off Trigger Input	PNP mode: +4VDC or greater to activate (max 26VDC) NPN mode: GND (<1VDC) to activate
Input Channel Current	PNP line: 4 mA @ 4VDC 10 mA @ 12VDC 20 mA @ 24VDC NPN line: 15 mA @ Ground (0VDC)
Output Channels	4 channels for lights plus 1 additional output, such as a camera trigger (Channel 9 follows light strobe line)
Output Connectors	4 5-pin M12 connectors 10 position screw terminal block – 14 AWG max wire size
Total Output Current (M12 Connectors)	Total Average Output Current: 8 A - sum of all 4 channels (polyfuse protected)
Output Channel Current (Per Channel)	Maximum average output current per any 1 channel 2.8 A PNP (sourcing): 65 mA
Analog Output (Per Channel)	Voltage: 1–10VDC, continuous mode intensity control Current: 0.5 mA max (with fault protection)
Indicator Lights	Power on = green light Ethernet = 2 indicator lights
Protection Circuitry	Polyfuse protection
Programming Connector	Ethernet port
SD Card	2 GB microSD card formatted as FAT/FAT16
Reset Button	Hold down for 3 seconds
Mounting	DIN rail
Dimensions	H = 120 mm (4.7"), L = 107 mm (4.2"), W = 45 mm (1.8")
Ambient Temperature	-18°–40° C (0°–104° F)
Ambient Humidity	0–95% non-condensing
Weight	~233g
Compliances	CE, RoHS
Warnings	The user must ensure that the potential difference between any combination of applied signals does not exceed the supply voltage. The LED Light Manager (LLM)-OEM must not be used in an application where its failure could cause a danger to personal health or damage to other equipment.
Terminal Blocks (Included)	2 position terminal block plug 8 position terminal block plug 10 position terminal block plug



RESOURCE CORNER

Additional resources are available on our website, including CAD files, Videos, and application examples.



INPUT TRIGGERING

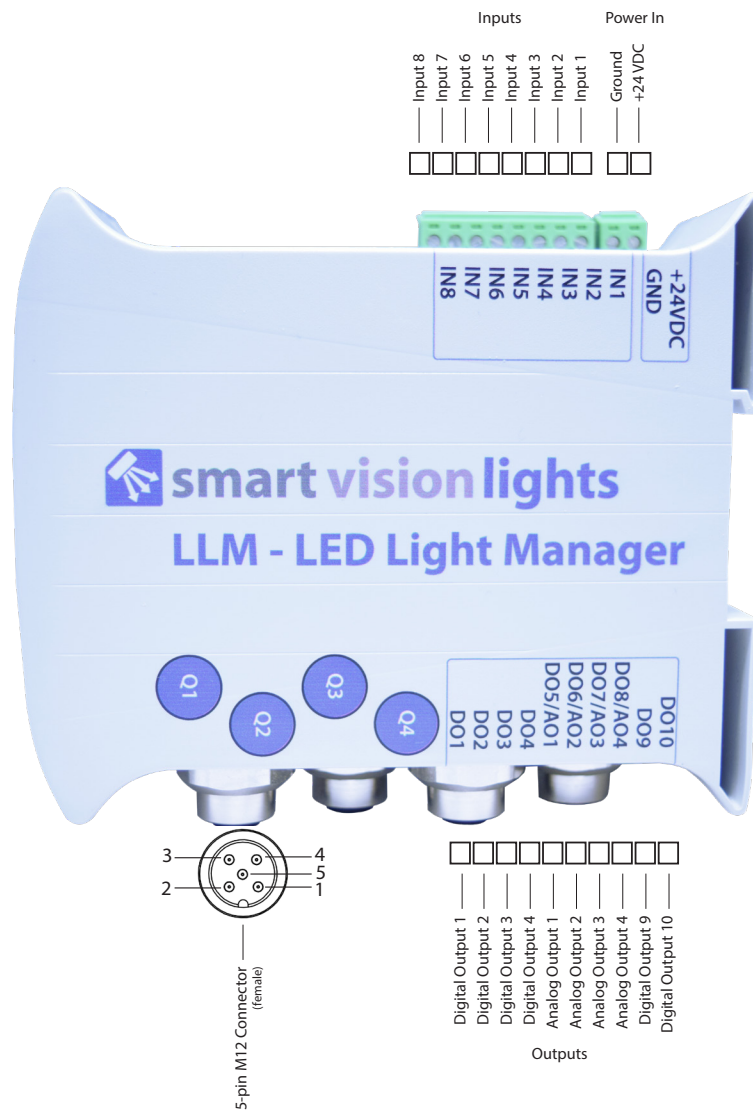
The LLM-OEM uses the following convention for setting up the input triggering.

PNP triggering: The triggering device provides a sourcing signal that is between 4VDC and 24VDC

NPN triggering: The triggering device provides a sinking signal that is at ground potential (typically less than 1VDC)



WIRING CONFIGURATION



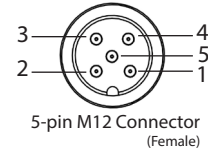


OUTPUT CONFIGURATION EXAMPLES

Using 5-pin M12 Connector

Lights can be connected using a standard 5-pin M12 connector. Up to four lights can be connected to a single LLM-OEM.

Using daisy-chainable and direct connect lights is possible as long as you do not exceed the 5-pin M12 connector max value (see Product Specifications for value).



5-pin M12 Connectors (Female) Pin Layout

Pin	Function	Signal
1	Power Out	+24VDC
2	NPN	Sinking Signal
3	GND	Ground
4	PNP	Sourcing Signal
5	Varies by Light*	Varies by Light*

*See Note

NOTE:

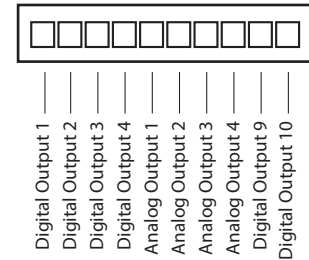
Smart Vision Lights recommends referencing the data sheet for each individual light for wiring configuration to determine exact wiring option and pin 5 function/signal.

Using Output Terminal Blocks

If using a light with an external driver or a non-Smart Vision Lights' light with an internal driver, use digital output (1–4) to trigger PNP input.

Analog output is used when managing intensity control.

Digital output (9) can be used for controlling additional output devices, such as a Camera Trigger.

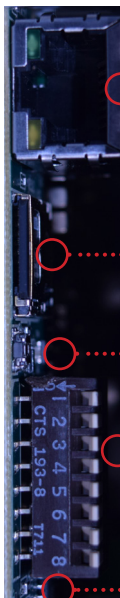


NOTE:

If lights are using a separate power source, number of lights per channel are limited only by digital output (1–4) or analog output (1–4). See Output Current per channel for digital output values or Analog Output per channel for analog output values in Product Specifications.



LLM-OEM FRONT PANEL



Ethernet Port

Allows you to connect an Ethernet cable to the LLM Lighting and Timing Manager.

MicroSD Card Reader

MicroSD Card used to store the program file. Required when using web page.

Reset Button

Smart Vision Lights recommends holding the reset button down for three seconds.

DIP Switches

DIP switches allow you to set the configuration of the LLM-OEM. See DIP switches section for more information.

On Indicator Light

Indicator light to show that the LLM-OEM has power.



DIP SWITCHES

← ON

1	Not Used		Not Used
2	Input NPN		Input PNP
3	Not Used		Not Used
4	Not Used		Not Used
5	Not Used		Not Used
6	Not Used		Not Used
7	Not Used		Not Used
8	Not Used		Not Used

The DIP switches located on the front of the LLM-OEM used to configure input events are as follows:

DIP Switch 2 Input Signal PNP/NPN

Allows you to select the input polarity as either PNP or NPN.

NOTE:

When a DIP switch is toggled, power cycling of the LLM-OEM is required to take effect.



MANAGING INPUT EVENTS

Trigger Delay and Pulse Duration must be in whole numbers only – no decimals or commas. When needing a fraction of time for milliseconds, you can put the equivalent microseconds value in the Trigger Delay. Example: For a 1.5ms Pulse Duration, enter 1500μs.

The maximum delay or strobe time is 65500ms (65.5 seconds).

NOTE:

Camera Trigger must be less than Trigger Delay and Pulse Duration time, or else the input event will trigger again.

$$\text{Camera Trigger} < \text{Trigger Delay} + \text{Pulse Duration}$$

NOTE:

Minimum pulse width for Camera Trigger is 250μs.



PROGRAMMING VIA WEB INTERFACE

Non-Expanded View of Web Page

	Input 1	Input 2	Input 3	Input 4
Light 1	100% ▾	100% ▾	100% ▾	100% ▾
Light 2	100% ▾	100% ▾	100% ▾	100% ▾
Light 3	100% ▾	100% ▾	100% ▾	100% ▾
Light 4	100% ▾	100% ▾	100% ▾	100% ▾
TD	10000 us ▾	20555 us ▾	35500 us ▾	100 ms ▾
PD	100 ms ▾	1000 ms ▾	25500 ms ▾	3000 ms ▾

Advanced Settings +

Mode: ☒ Normal ☐ Setup

Save

Expanded View of Web Page Showing Communication Time

	Input 1	Input 2	Input 3	Input 4
Light 1	100% ▾	100% ▾	100% ▾	100% ▾
Light 2	100% ▾	100% ▾	100% ▾	100% ▾
Light 3	100% ▾	100% ▾	100% ▾	100% ▾
Light 4	100% ▾	100% ▾	100% ▾	100% ▾
TD	10000 us ▾	20555 us ▾	35500 us ▾	100 ms ▾
PD	100 ms ▾	1000 ms ▾	25500 us ▾	3000 ms ▾

Advanced Settings –

Startup Communication Initialization Time 200 ms ▾

Normal Mode Communication Time 750 us ▾

Light Settling Time 10 ms ▾

Mode: ☒ Normal ☐ Setup

Save

NOTE:

The displayed values are factory settings and can be changed as needed.

The extra information displayed in the expanded view is as follows:

- Startup Communication Initialization Time: Allows user to set initial communication period on start-up
- Normal Mode Communication Time: Allows user to set a minimum communication period for normal operation
- Light Settling Time: Allows user to set the delay time when exiting Setup Mode
- Mode:
 - Normal: Inputs 1-4 are monitored for triggers, the Ethernet port is monitored on a user settable time schedule.
 - Setup: All channels are continuously turned on to the intensity settings of Input 1. The Ethernet port is monitored for communication.

Programming the LLM-OEM

- Open web browser and enter IP address (default IP address: 192.168.0.200)
- The web page will be displayed (the data fields will be initially empty)
- The following message will be displayed "Data loaded! Click OK to display data"
- Click OK, the data on the SD card will be displayed
- Once the data is displayed, make desired updates
- Review your updates
- Click on Save to save the updated data
- The following message will be displayed "Data saved", Click OK

NOTE:

The LLM-OEM default IP address is set to: **192.168.0.200**.

The IP address can be changed via the ip.txt file located on the SD Card.

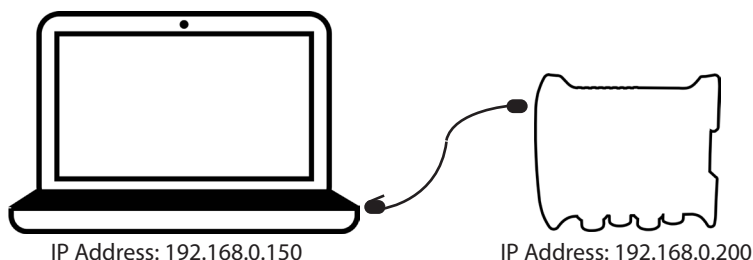
NOTE:

Time input range for Trigger Delay,*
Pulse Duration, and Advanced Setting Times is:
20 μ s-65500ms.

Minimum time for "Normal Mode Communication Time", and consequently, the COMMnorm variable is 250 μ s.

If your network is not set up to use 192.168.0.xxx, you will need to connect a computer to the LLM-OEM using a standard Ethernet cable (such as a Cat5e cable). Set your computer's IP address manually to 192.168.0.150. Set the subnet to 255.255.255.0. You will now be able to communicate with the LLM-OEM via your web browser.

Note: Make sure you set your computer back to the network settings prior to making the above changes to ensure your computer works properly on your network.



Managing Multiple LLM-OEMs on the Same Network

The IP address for the LLM-OEM is static. The IP address is not dynamic and cannot be set via DHCP.

By setting each LLM-OEM IP address differently will allow multiple LLM-OEMs to be on the same network. See IP Address section for more details.



PROGRAMMING VIA COMMANDS

Using terminal software will allow for communicating changes to the LLM-OEM using the command structure covered in the LLM-OEM Command Protocol Manual. The command structure allows the LLM-OEM settings to be updated over TCP/IP by ACSII strings/commands.



SETTING STATIC IP ADDRESS

NOTE:

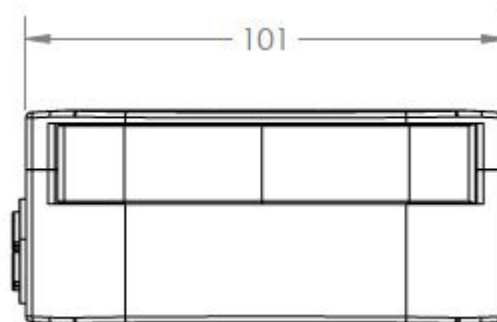
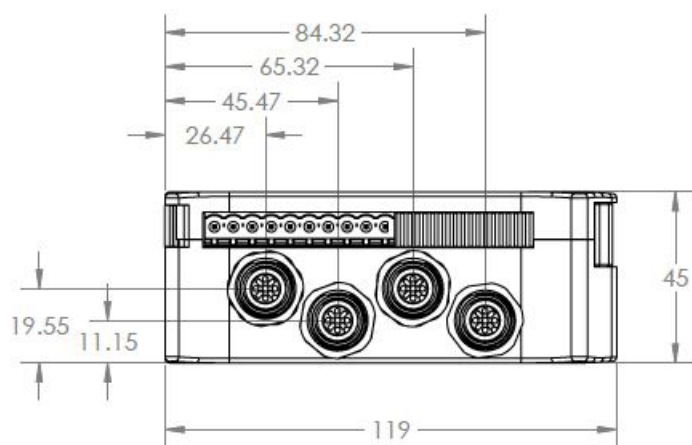
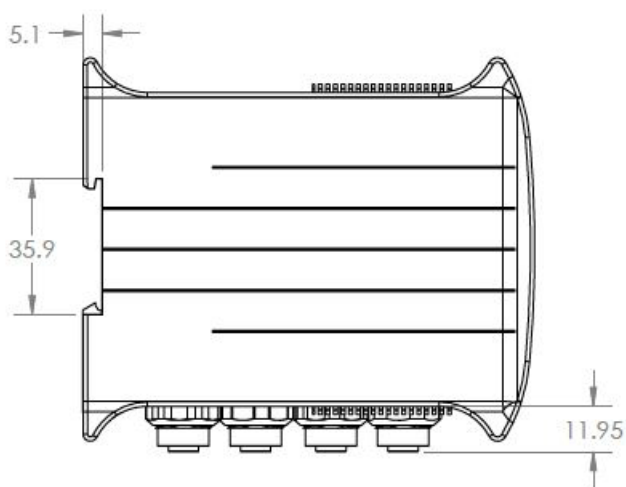
The IP address for the LLM-OEM is static. The IP address is not dynamic and cannot be set via DHCP.

The default IP address is: 192.168.0.200. To change the IP address, remove the SD card from the LLM-OEM and locate the ip.txt file. Open this file and change the IP address. Save the file. Place the SD card back into the LLM-OEM and restart the unit.



PRODUCT DRAWING

Dimensions are in mm.





ACCESSORIES

Connector Cables



Lengths	Part Number
5 m	5PM12-5
10 m	5PM12-10
15 m	5PM12-15

Jumper Cables



Lengths	Part Number
300 mm	5PM12-J300
1000 mm	5PM12-J1000
2000 mm	5PM12-J2000

Jumper Cables



Lengths	Part Number
2000 mm	5PM12-J2000-BLK



GLOSSARY

This glossary covers all Smart Vision Lights product families; some content in this section may not apply to this specific product.

TERMINOLOGY

OverDrive™ Lights include an integrated high-pulse driver for complete LED light control.

Continuous Operation Lights stay on continuously.

Multi-Drive™ Combines continuous operation and OverDrive™ strobe (high-pulse operation) mode into one easy-to-use light.

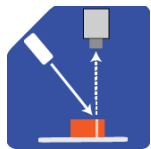
Built-in Driver The built-in driver allows full function without the need of an external controller.

Camera to Light Connecting the light directly to the camera, without the need for additional controllers or equipment.

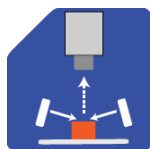
Polarizers Filters that reduce reflections on specular surfaces.

Diffuser Used to widen the angle of light emission, reduce reflections, and increase uniformity.

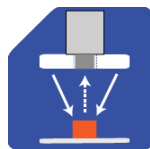
TYPES OF ILLUMINATION



Projector



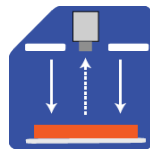
Dark Field



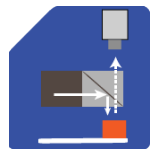
Radial



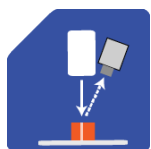
Bright Field



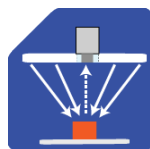
Direct



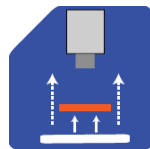
Axial



Line



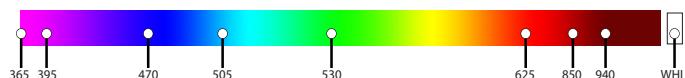
Diffuse Panel



Backlight

COMMON COLOR/WAVELENGTHS LEGEND

Wavelength options range from 365 nm to 1550 nm. Additional wavelengths available for many light families.



Shortwave Infrared LEDs are available in 1050 nm, 1200 nm, 1300 nm, 1450 nm, and 1550 nm.