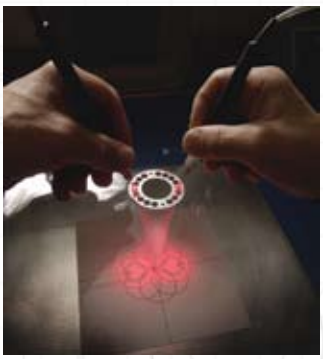
Advanced illumination

PRODUCT SOURCEBOOK

LED Lighting
&
Electronics

Image Experts for the Factory Floor

At Advanced illumination (Ai), we understand just how difficult it can be to choose the correct light source in order to acquire the best image for your applications. We built our business by focusing on the factory floor. Our mission is to make your challenges our challenges by providing complete service and support of tested and proven light sources using dependable solid state technology. Our vision is to become *the* trusted lighting source for factory automation professionals by partnering with the world's leading integrators, distributors, and developers of machine vision technology.



Advanced Lighting Technology

To help our customers implement a robust lighting solution, we developed the Flexible Response Product System® utilizing Evenlite™ technology and our Expandable Lighting products. The best lighting solution will increase the accuracy of your inspection and allow the camera to process clear digital images with speed and dexterity.

Advanced Control

Each Ai light is built with an internal electronic signature. Upon connection to a microprocessor-based SignaTech controller, the light signature is read and the controller automatically configures itself to output the optimum current level for a given pulse width. The SignaTech control system also applies to steady state, DC operation for those applications that do not require strobing.

Advanced Flexibility

Ai's Flexible Response Product System combines our best technological innovations: Flexibility begins with Standard Variations - standard product housings built with end-user choice of LED wavelength, power input, stand-off, working distance, and mounting options, *built within two weeks.* If a standard housing does not suit the application, our Expandable Lighting System offers standard lighting technology in sizes to match your needs. Evenlite technology allows structured lighting effects to be developed far more easily than in the past. And finally, Signatech and Signatech II control systems round out the Flexible Response Product System by maximizing interchangability between lighting and control components without compromising performance.

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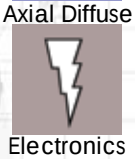

About Ai

Since 1993, Advanced illumination has been a world leader in the design and manufacture of LED based lights for the machine vision industry. Featuring patented Evenlite LED aiming technology, Ai's extensive product line includes a number of exclusive designs, including RGB lightheads and Broad Area Linear Arrays.

Applications Lab Our applications lab can help you determine the most appropriate lighting for your inspection - free of charge. Simply send a sample and a completed questionnaire (***Send Us A Sample*** on our web site) to "Applications Lab" at the address listed below, and we will email you a solution report with bitmapped images to evaluate using your own vision tools.

Evaluation Lights Our goal is to make sure your lighting provides optimal results. Once we've proven a solution in the lab, we offer lights for evaluation purposes - giving you two weeks to test the solution and decide if it meets your needs.

Contact Ai

Office Hours:
Monday - Friday
8:30 - 5:00 EST

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Rochester VT 05767

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Send information requests to: sales@advill.com

Advanced illumination designs the most innovative LED lighting systems in the world

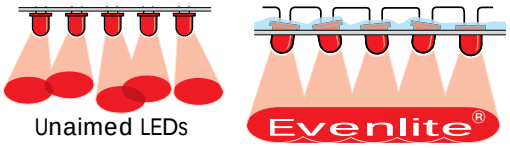
FREE Application Lab Support

FREE Light Evaluation Program

- Evenlite® LED Aiming Technology for optimized light consistency and flexibility
- More than 100,000 unique configurations to meet your exact specifications
- Signatech® smart electronics provide unrivaled control
- Expandable Lights built to custom sizes in 2 weeks!
- All lights can be configured to work with user supplied 24v

Evenlite®

Evenlite® is Ai's patented core LED aiming technology, enabling us to put light exactly where it is needed. Our proprietary targeting process provides the foundation for an extremely functional, consistent array of machine vision lights.



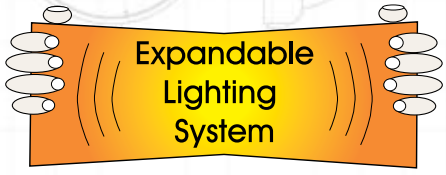
The LED manufacturing process often results in LEDs with diverging mechanical and optical axes. We aim every LED based on its optical axis, and by doing so overcome the uneven illumination found in other LED light sources. By aiming, we use fewer LEDs than competing products, resulting in lower operating temperatures. Under normal circumstances our products do not need cooling fans or heat sinking.

Evenlite II®

The newest aiming technology from Ai is Evenlite® II, used to maximize the output of high current LEDs. This new process allows us to create consistent illumination from greater distances and over larger areas than was previously possible with standard LEDs.

Expandable Lighting System

Proven light technologies in sizes built to fit your needs. That's the idea behind Ai's new line of Expandable Lighting products. Surface mount LED back lights, Broad Area Linear Arrays, and Line Lights are among the lights available in customized sizes: Built specifically for your application - in TWO WEEKS!



Look for this symbol, indicating Expandable Lighting Products!

Standard Variations

Customized Lights in 2 Weeks!

Our patented LED aiming process allows us to "soft customize" a light in two weeks or less. Customizable variables include working distance, field of view, wavelength, lensing, mounting, and powering options. Ai offers literally *thousands* of standard variations, built specifically to meet your needs.

EXCLUSIVE RGB

Ai is the only LED machine vision lighting manufacturer building RGB lightheads. Combining red, green & blue LEDs makes a bright white that is color tunable for maximum image contrast. RGB lights have much longer lifespans than the white LEDs currently available .

The largest selection of controllers & electronic solutions in the Machine Vision Industry.

The power behind Ai's lights is an extensive range of supporting electronics: from current regulators to high speed strobes, and our new high output Pulsar for large light arrays and high current LED products. Signatech® – our proprietary signature recognition software - is built into all our electronics.

Controllers

Strobe Controllers - S4000, S6000 & S6000-AS

- S4000 (single) and S6000 (dual output) strobe controllers
- Independent channel control for 4 channels, and up to 4 amps per channel
- Three modes of operation (constant, trigger, test)
- S6000-AS offers asynchronous triggering for use on parallel production lines

Digital Channel Mixers - MS210, MS220, CS410 & CS420

- MS210 and MS220 controllers offer dual output control for color mixing
- CS410 and CS420 controllers provide dual independent intensity control (0-100%).
- MS220 and CS420 offer convenient onboard touchpad control.

Constant Current Controllers - CS100 & CS300

- Single or dual output current regulation. Optional intensity control.

Signatech®

Ai's microprocessor based Signatech® electronics verify the electronic signature of a light head and automatically adjust the maximum current output accordingly. This feature optimizes light output and LED life. New Signatech II expands the original capabilities for large arrays and high current LEDs.

EXCLUSIVE

Turbo-Charging

Increasing light intensity and extending LED life, Turbo-Charging is the process of precisely synchronizing high bursts of current, at a safe duty-cycle, through our lights during camera integration time. Turbo-charging maximizes the amount of information the camera receives in the shortest time possible.

NEW! Pulsar 710 NEW!

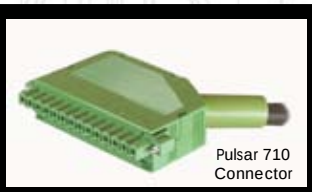
The newest Ai strobe controller offers high intensity output for large lighting arrays and high current LEDs. With a number of features designed to maximize the output of a wide range of lights, the new Pulsar provides:

- A stunning 100 amps at 100 volts total output in pulsed mode
- Multiple units that can be daisy chained from a single trigger source
- 8 amps at 24 volts in constant mode
- Four-channel outputs
- Signatech and Signatech II compatibility

Pulsar 710

Ai Power Options

Most standard lights are configured for use with Ai electronics and are not designed to be connected directly to an unregulated 24v source. *Cutting the cable voids the warranty (see page 23).*



Pulsar 710 Connector

Standard Connector

12 & 24 volt* (flying leads)

High current lights can be configured for use with the Pulsar 710.

12 and 24 volt lights are built with flying leads, for use with any regulated 12 or 24v DC power source. Load limiting resistors ensure safe operation and long LED life.

*12 volt option is not available with all lights. Please see product spec sheets for details.

High Current LEDs

NEW PRODUCTS

Offering long range illumination and high intensity output, high current LEDs can be used in a wide range of machine vision applications. Ai offers a variety of styles to choose from.

DL072
1 High Current LED
Dim.: 94 x 32mm (3.70 x 1.27")
F.O.V.: 25 x 25mm (1.0" x 1.0")
Cable: 1.5 meters (4.9')
Standard Part:
DL072-WHI24-001

SL066
1 High Current LED
Dim.: 32mm x 23.9mm (1.26" x .94")
F.O.V.: 65mm (2.5")
Custom Product
Call for Details

LL068
6 High Current LEDs
Illum. Length: 305mm (12.0")
Housing Length: 342.9mm (13.5")
Cable: 1.5 meters (4.9')
Standard Part:
LL068-WHI24-002

SL073
1 High Current LED
O.D.: 152mm (6.0")
I.D.: 57mm (2.25")
F.O.V.: 130mm (5.0")
Cable: 1.5 meters (4.9')
Standard Part:
SL073-WHI24-001

Lighting Tip:

Did you know Turbo-Charged Strobing can overcome ambient light contribution, even when white light must be used?

All High Current LED Lighting Products are available in the following wavelengths: 470nm (blue); 530nm (green); 625 (red); and WHI (white).

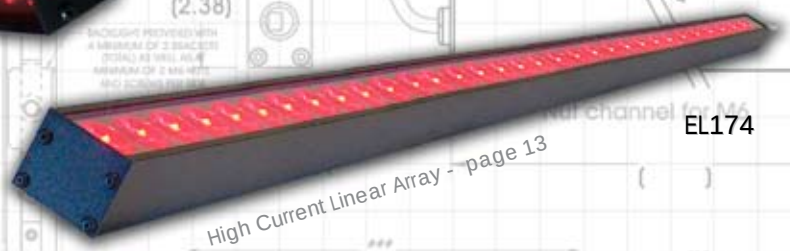
ELS (Expandable Lighting System)

Ai's Expandable Lighting System products combine proven lighting technology with the flexibility of a light sized to meet your specific application needs. ELS lights are simply custom sized versions of our standard lights.

NEW PRODUCT

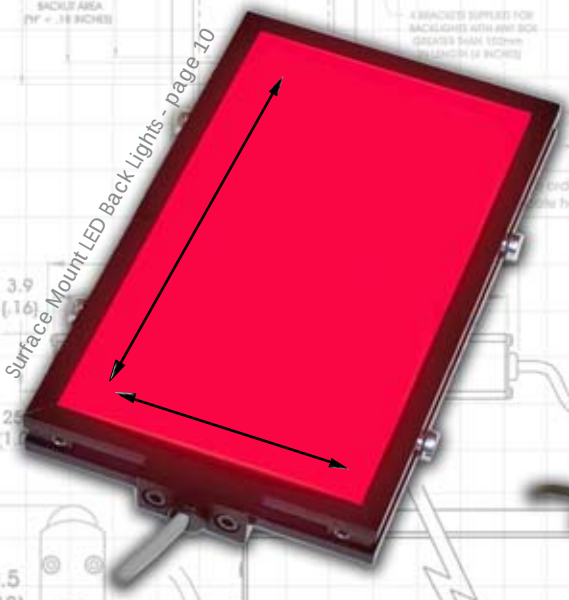
EL150

Broad Area Linear Array Technology - page 9



EL174

High Current Linear Array - page 13



Surface Mount LED Back Lights - page 10

BLXXYY01

High Current LED Line Lights - page 12

LL068

EL193

Back Light Strips - page 10

EL150
Broad Area Linear Array
Housing Width: 34mm (1.33")
Length Increments: 25mm (1")
Max. Length: 2032mm (80")
Cable: 1.5 meters (4.9')

EL174
High Current LED Line Light
Housing Width: 34mm (1.33")
Length Increments: 25mm (1")
Max. Length: 1829mm (72")
Cable: 1.5 meters (4.9')

LL068
High Current LED Line Light
Housing Width: 40.9mm (.1.61")
Length Increments: 152mm (6")
Max. Length: 2438mm (96")
Cable: 1.5 meters (4.9')

BLXXYY01
Surface Mount LED Back Light
Length Increments: 25mm (1")
Max. Illuminated area:
1778mm x 1778mm (70"x70")
Cable: 1.5 meters (4.9')

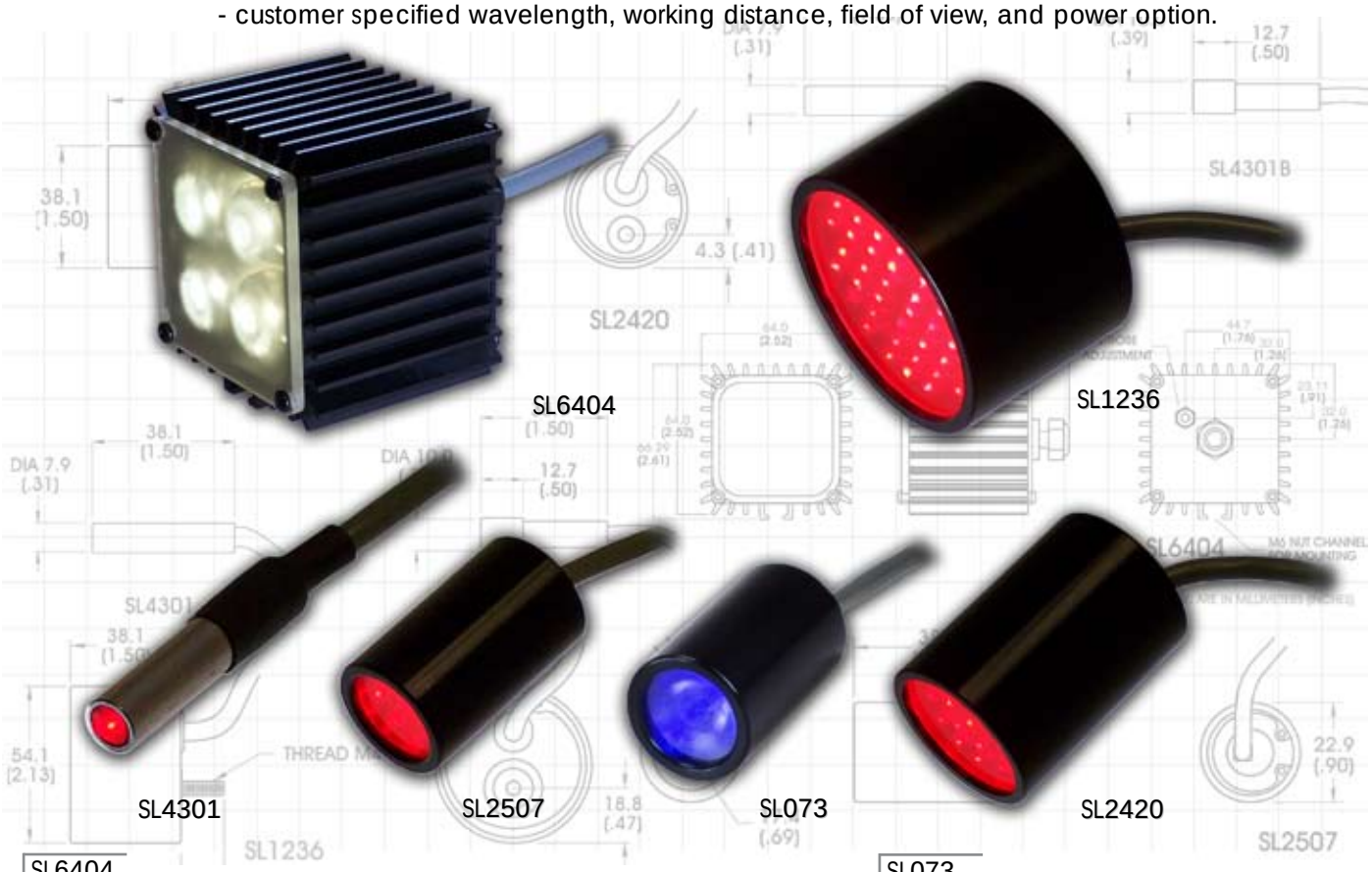
EL193
Back Light Strip Light
Housing Width: 34mm (1.33")
Length Increments: 25mm (1")
Max. Length: 2032mm (80")
Cable: 1.5 meters (4.9')

- Same Day Quotes
- 5 different light types to choose
- Larger sizes may require Pulsar 710 or customer supplied 24v power supply
- Lengths: LL068 up to 96"; EL174 and EL150 up to 80"; or as large as 70" x 70" for back lights
- Please consult with our engineers to ensure you order the correct light for your needs

For specific ordering information, please see individual spec sheets.

Spot Lights

Ai's Spot Lights provide significantly uniform illumination for creating high contrast. Standard configurations are shipped next day, or within two weeks when ordered as a Standard Variation - customer specified wavelength, working distance, field of view, and power option.



SL6404
4 High Current LEDs
O.D.: 64mm (2.51")
F.O.V.: 65mm (2.5")
Cable: 1.5 meters (4.9')
Standard Part:
SL6404-WHI300M

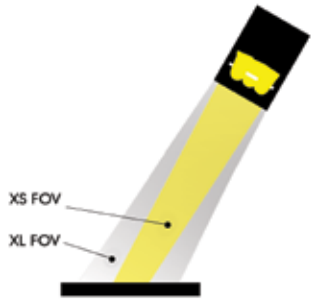
SL1236
36 LEDs
O.D.: 54mm (2.12")
F.O.V.: 45mm (1.8")
Cable: 1.5 meters (4.9')
Standard Part:
SL1236-660100L

SL4301
1 LED
O.D.: 8mm (.31")
Cable: 1.5 meters (4.9')
Standard Part:
SL4301-660

SL2507
7 LEDs
O.D.: 23mm (.90")
F.O.V.: 30mm (1.2")
Cable: 1.5 meters (4.9')
Standard Part:
SL2507-66075L

SL073
1 High Current LED
O.D.: 23mm (.90")
F.O.V.: 30mm (1.2")
Cable: 1.5 meters (4.9')
Standard Part:
SL073-WHI24-001

SL2420
20 LEDs
O.D.: 38mm (1.5")
F.O.V.: 45mm (1.8")
Cable: 1.5 meters (4.9')
Standard Part:
SL2420-660100L



Light Function Diagram

- Compact designs
- High intensity illumination for non-specular objects
- Can be ordered to light a given field of view from a specified distance
- SL1236 is available in an RGB "all color" version

Lighting Tip:

Problem with ambient light? Try a monochrome light, such as red, with a matched red 660nm band pass filter attached to your camera lens.

All 5mm LED spot lights are available in the following wavelengths: 470nm (blue); 520nm (green); 590nm (yellow); 625nm (orange); 660nm (red); 880nm (infra-red); and WHI (white). The SL1236 is also offered in RGB (red, green, blue) "all color" versions.
The high current SL6404 and SL073 are available in the following wavelengths: 470nm (blue); 530nm (green); 625nm (red); and WHI (white).

Broad Area Linear Arrays

Ai's unique Broad Area Linear Arrays (BALA) are designed to provide a long, wide field of illumination with controlled "fall off" in the transverse direction. Originally designed for inspecting circuit boards, these versatile lights can be applied in both dark field and bright field situations. The EL150 is available in lengths up to 80".

Expandable Lighting System

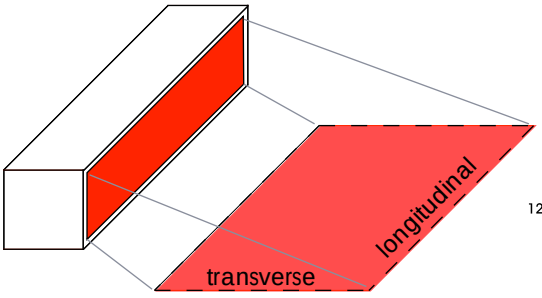
AL4424
4" Length/24 LEDs
Housing Length: 119mm (4.72")
Illuminated Length: 117mm (4.6")
Cable: 1.5 meters (4.9')
Standard Part: AL4424-660

AL4554
9" Length/54 LEDs
Housing Length: 249mm (9.82")
Illuminated Length: 246mm (9.70")
Cable: 1.5 meters (4.9')
Standard Part: AL4554-660

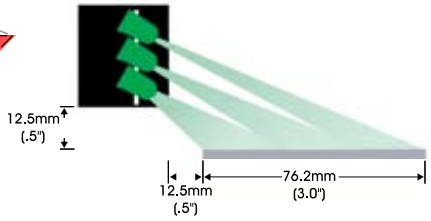
AL46120
20" Length/120 LEDs
Housing Length: 534mm (21.04")
Illuminated Length: 531mm (20.93")
Cable: 1.5 meters (4.9')
Standard Part: AL46120-660

EXPANDABLE!

EL150
Expandable BALA
Housing Width: 33mm (1.33")
Length Increments: 25mm (1")
Max. Length: 2032mm (80")
Cable: 1.5 meters (4.9')



Light Function Diagram



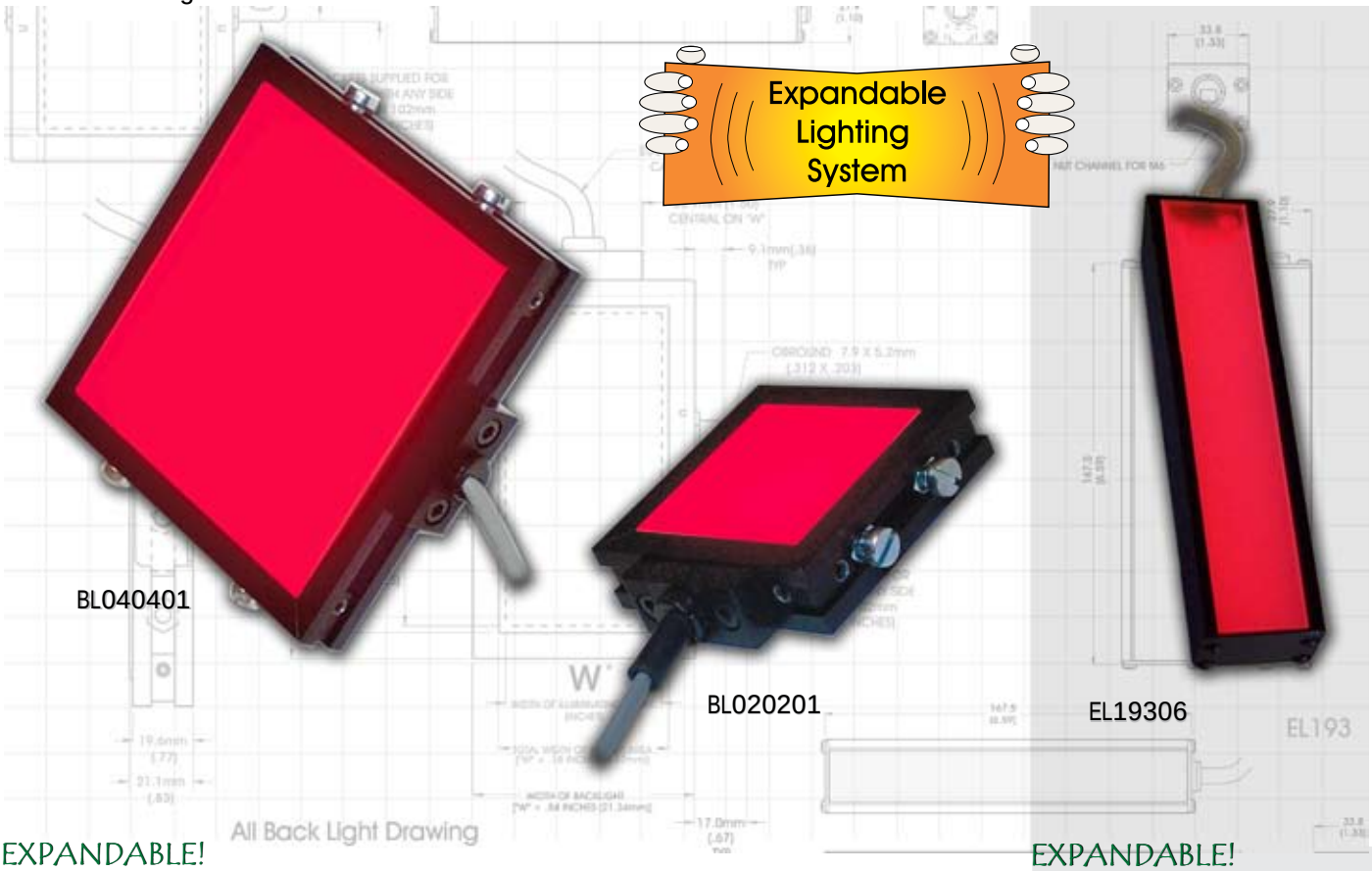
Recommended BALA Set Up

- Low angle incidence illumination over a long, wide area
- Extremely even illumination over the full lighted length, with controlled "fall off" in the transverse direction
- For wider coverage, two BALAs can be aligned opposite to and facing each other

All Broad Area Linear Arrays are available in the following wavelengths: 470nm (blue); 520nm (green); 590nm (yellow); 625nm (orange); 660nm (red); 880nm (infra-red); and WHI (white).

Surface Mount LED Back Lights

Surface mount LED back lights provide significant uniformity over the entire active area of illumination. BL models feature an integral nut channel for easy mounting (brackets are also included) and can be ordered in 1" increments up to 70" x 70". The EL193 can be ordered in 1" increments up to 80" in length.



EXPANDABLE!

BLXXYY01
Surface Mount LED Back Light
Length/Width Increment: 25mm (1")
Max. illuminated Size:
1778mm x 1778mm (70"x70")
Cable: 1.5 meters (4.9')

- Sizes up to 70" x 70"
- Choice of red or infra-red
- Fast Mounting option with M6 nut channel

BL040401
192 LEDs
Dim.: 123mm x 123mm
(4.84 x 4.84")
F.O.V.: 100mm square (4")
Cable: 1.5 meters (4.9')
Standard Part:
BL040401-660

BL020201
48 LEDs
Dim.: 72mm x 72mm
(2.84 x 2.84")
F.O.V.: 50mm square (2")
Cable: 1.5 meters (4.9')
Standard Part:
BL020201-660

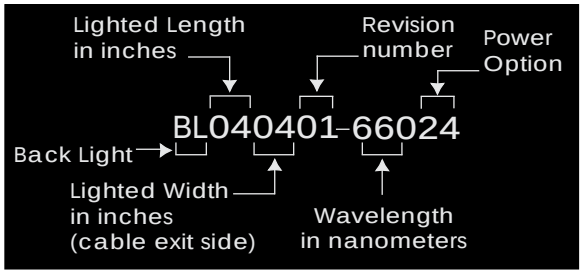
EXPANDABLE!

EL193
Back Light Strip
Lighted Width: 25mm (1.0")
Housing Width: 33mm (1.33")
Length Increments: 25mm (1")
Max. Length: 2032mm (80")
Cable: 1.5 meters (4.9')

- Lengths up to 80"
- Fast mounting option with M6 nut channel
- Choice of red or infra-red

Build Your Own Back Light:

Creating a Surface Mount Back Light Part Number



Lighting Tip:

The human eye sees differently than a vision system. When it comes to testing a lighting solution, always judge the lights based on what the camera sees.

Light Function Diagram

All Surface Mount Back Lights are available in the following wavelengths: 660nm (red); and 880nm (infra-red).

Back Lights

Side Fired

A reliable option for measuring, placement or sorting applications, Ai Back Lights are built using Evenlite LED aiming technology. Standard lights are shipped next day; Standard Variations, with customer specified color or power options, ship within two weeks.

BL41192
192 LEDs
Housing: 230 x 207mm
(9.06 x 8.16")
F.O.V.: 203 x 152mm
(8 x 6")
Cable (x2): 1.5 meters (4.9')
Standard Part:
BL41192-660

BL47192*
192 LEDs
Housing: 256 x 256mm
(10.1 x 10.1")
F.O.V.: 203 x 203mm
(8 x 8")
Cable (x2): 1.5 meters (4.9')
Standard Part:
BL47192-660

BL18120*
120 LEDs
Dim.: 230mm x 157mm
(9.06 x 6.16")
F.O.V.: 203 x 101mm
(8 x 4")
Cable (x2): 1.5 meters (4.9')
Standard Part:
BL18120-660

BL1520
20 LEDs
Housing: 95 x 78mm
(3.72 x 3.05")
F.O.V.: 50 x 50mm
(2 x 2")
Cable: 1.5 meters (4.9')
Standard Part:
BL1520-660

BL5420
20 LEDs
O.D.: 38mm (1.5")
F.O.V.: 4mm or 20mm
(.18") or (.79")
Cable: 1.5 meters (4.9')
Standard Part:
BL5420-6604

BL2850*
50 LEDs
Dim.:183 x 88mm
(7.23 x 3.47)
F.O.V.: 44 x 152mm
(1.75 x 6")
Cable: 1.5 meters (4.9')
Standard Part:
BL2850-660

BL1960
60 LEDs
Dim.:156 x 128mm
(6.16 x 5.06")
F.O.V.: 101 x 101mm
(4" x 4")
Cable: 1.5 meters (4.9')
Standard Part:
BL1960-660

*not shown


Light Function Diagram

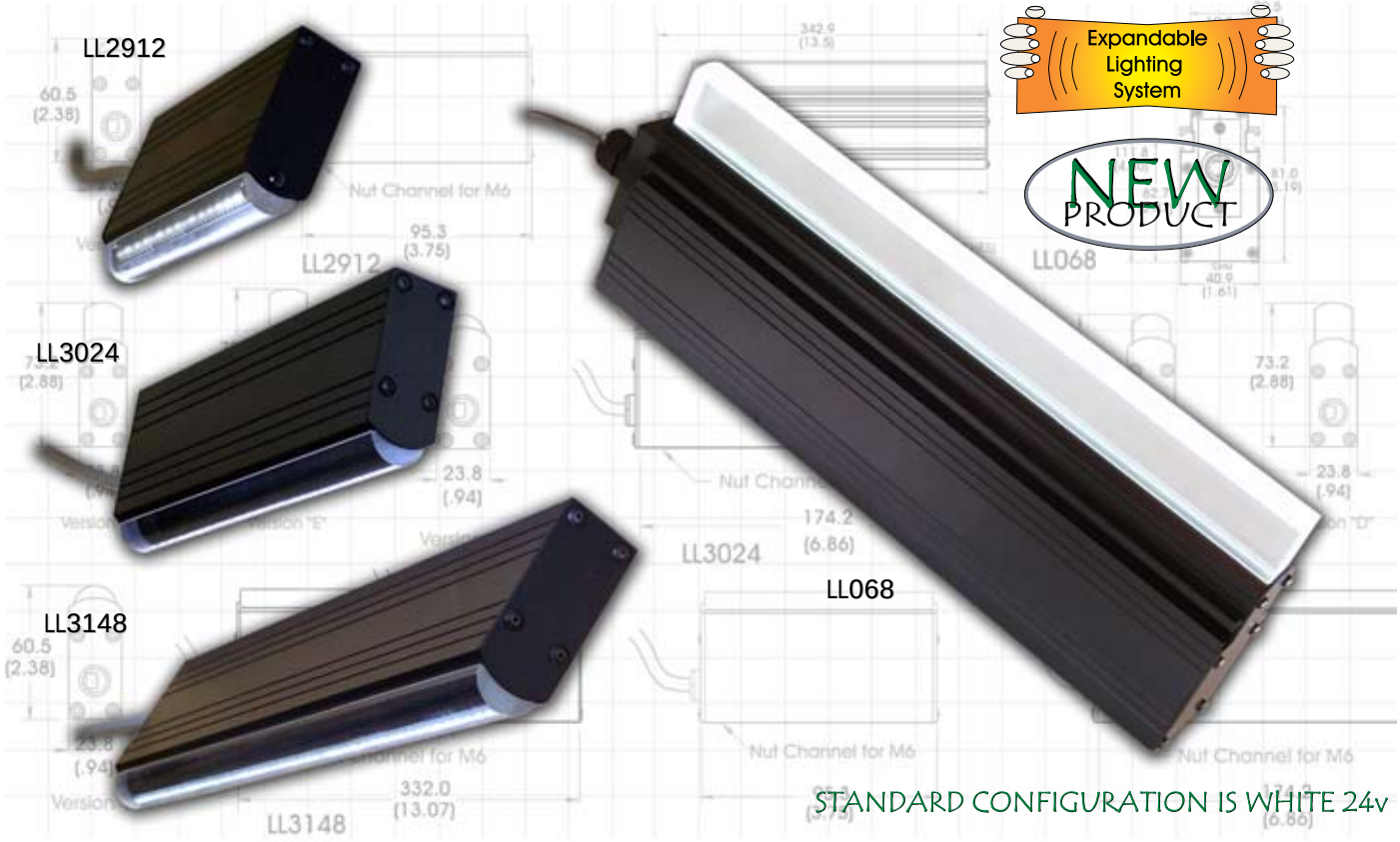
Lighting Tip:
Sometimes light color is the key to creating greater contrast. Changing the wavelength of the light can be an easy and inexpensive way to improve your inspection. *(See page 21)*

- Low profile housings
- Available in a wide range of wavelengths
- For use in DC Continuous and strobed applications

All side fired back lights are available in the following wavelengths: 470nm (blue); 520nm (green); 590nm (yellow); 625nm (orange); 660nm (red); and 880nm (infra-red).

Line Lights

Ai's Line Lights provide a narrow band of intense illumination for use in web inspections or in non-specular applications requiring a long, thin field of view. Two different designs are available in four standard sizes, or custom lengths up to 96" for the LL068 or 80" for the EL163.



STANDARD CONFIGURATION IS WHITE LEDs WITH AI CONNECTOR

LL2912
3" Length
12 LEDs
Illuminated Length: 76mm (3.0")
Housing Length: 95mm (3.75")
Cable: 1.5 meters (4.9')
Standard Part:
LL2912A-WHI

LL3024
6" Length
24 LEDs
Illuminated Length: 152mm (6")
Housing Length: 174mm (6.86")
Cable: 1.5 meters (4.9')
Standard Part:
LL3024A-WHI

LL068
12" Length
12 High Current LEDs
Illuminated Length: 305mm (12.0")
Housing Length: 308.1mm (12.13")
Cable: 1.5 meters (4.9')
Standard Part:
LL068-WHI24-002

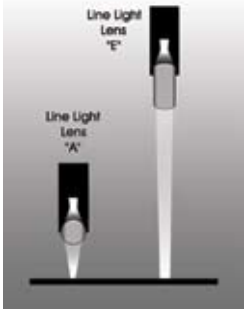
EXPANDABLE!

LL068
High Current LED LIne Light
Housing Width: 40.9mm (1.61")
Length Increments: 152mm (6.0")
Max Length: 2438mm (96")
Cable: 1.5 meters (4.9')

LL3148
12" Length/48 LEDs
Illuminated Length: 305mm (12")
Housing Length: 332mm (13.07")
Cable: 1.5 meters (4.9')
Standard Part:
LL3148A-WHI

EXPANDABLE!

EL163
Standard LED Line Light
Housing Width: 24mm (.94")
Length Increments: 38mm (1.5")
Max. Length: 2032mm (80")
Cable: 1.5 meters (4.9')



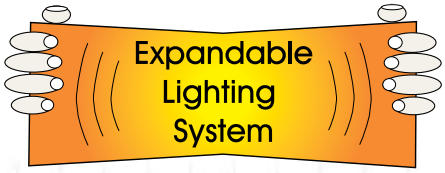
Light Function Diagram

- Ideally suited for use with line-scan applications
- Standard lengths, or build your own with the EL163 and LL068
- ELS lengths up to 80"; LL068 lengths to 96"

All 5mm LED line lights are available in the following wavelengths: 470nm (blue); 520nm (green); 590nm (yellow); 625nm (orange); 660nm (red); 880nm (infra-red); and WHI (white). The LL068 is available in the following wavelengths: 470nm (blue); 530nm (green); 625nm (red); and WHI (white).

Linear Array Lights

High Current LEDs



Ai's high current LED Line Lights provide significant illumination for web applications, and can be used for larger area inspections such as robotic work cells. Three standard sizes are available, plus the EL174, which can be ordered in lengths up to 72".

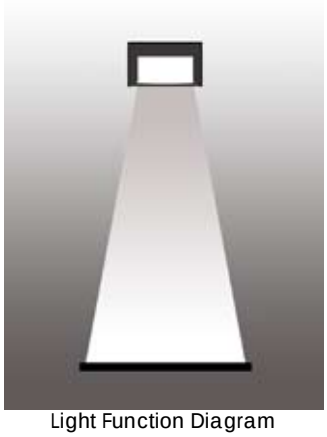
LL5806
6 High Current LEDs
Illuminated Length: 152mm (6.0")
Housing Length: 171mm (6.74")
Cable: 1.5 meters (4.9')
Standard Part:
LL5806-WHI24

LL6212
12 High Current LEDs
Illuminated Length: 304mm (12.0")
Housing Length: 322mm (12.7")
Cable: 1.5 meters (4.9')
Standard Part:
LL6212-WHI24

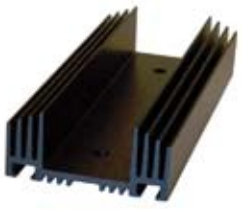
LL6324
24 High Current LEDs
Illuminated Length: 609mm (24.0")
Housing Length: 627mm (24.7")
Cable: 1.5 meters (4.9')
Standard Part:
LL6324-WHI24

EXPANDABLE!

EL174
High Current LED Linear Array
Housing Width: 33mm (1.33")
Max. Length: 1829mm (72")
Cable: 1.5 meters (4.9')



Light Function Diagram



For high current LED line lighting situations that require additional heat dispersion, Ai offers an optional heat sink.

- High intensity illumination from a long distance
- Useful for large area lighting
- Easy mounting via M6 nut channel
- Optional heat sink available

All High Current LED Line Lights are available in the following wavelengths: 470nm (blue); 530nm (green); 625nm (red); and WHI (white).