The better the lighting solution, the better your machine vision system will perform. Accurate, reliable and repeatable performance means greater productivity at a lower cost to you.

Innovative NERLITE lighting products have enabled machine vision and automation solutions to perform reliably in a wide range of applications. Our NERLITE solution provides the ideal light for your application. From very low level background lighting to very high peak light conditions, there are many variations of our lighting techniques to choose from. The right lighting solution for an application can greatly influence the quality of the images. The better the light, the clearer the vision.

NERLITE Technology

Siemens Machine Vision’s lighting products are manufactured under the brand name of NERLITE. NERLITE is widely recognized around the globe as the “standard” for machine vision illumination and machine vision imaging. The NERLITE brand encompasses a wide selection of products, including:

- Area Arrays, Spot Lights, Linear Arrays (Line Lights), Ring Lights, or Dome Illuminators
- Backlight and Dark-Field Illuminators
- DOAL & COAL – Diffuse On-Axis Light & Collimated On-Axis Coaxial Lights
- SCDI – Square Continuous Diffuse Illuminator
- CDI – “Cloudy Day” Continuous Diffuse Illuminator
- MAXlite – Multi-Axis Light
- and also NERLITE designed custom illuminators for OEMs

Lighting Techniques

NERLITE machine vision lighting products are designed to control "light delivery" to the CCD array (camera.) There are many lighting techniques to choose from. The right lighting technique for an application can greatly influence the quality of the images. The better the light, the clearer the vision.

Our team of lighting experts is ready to evaluate your application and configure a NERLITE solution: one that delivers the high-contrast images your vision system needs for feature or flaw detection, no matter how difficult the challenge.

The Siemens sales and support network, a combination of in-house expertise and industry partners, spans the globe providing fast access to NERLITE solutions and the high availability support your business needs.

Applications

- Electronic Components
- Fiducial Locations
- Blister Packs
- Semiconductor Wafers and Dies
- Ball Grid Arrays
- Dispensing
- Tinned PCBs
- Solder Packs
- Direct Part Marking Scanning
- Vial Scanning
- Robotic Guidance
- Print on Foil
- 2-D Symbology/ OCR
- Beverage Containers
- Label Inspection
- Component Presence
- Automotive
- Electrical
- Semiconductor
- 2-D Symbology/ OCR
- Pharmaceutical
- Packaging
- Mail/Package Sorting
- General Manufacturing
- Food and Beverage
- Printing
- Warehousing
- CD/DVD Production

...and more!
The LALL’s high intensity, lower power consumption, compact ardous dust, lint and fibers, and are corrosion resistant.

Typical Applications

- **Traffic monitoring** (roadways, railways, runways)
- **Label placement inspection**
- **Component presence and orientation**
- **Packaged product inspection (blister-packed pharmaceuticals)**
- **Compact disk artwork verification**
- **Electronics component inspection**
- **Differentiate specular, diffuse, or absorptive features on a variety of applications**
- **Reduce shadows**
- **Measure thickness of materials**
- **Illuminate flat, diffused surfaces**
- **Evenly illuminate flat shiny surfaces**
- **Arrange for bright-field reflection** or for bright-field illumination for diffused surfaces.
- **With this coaxial lighting approach, specular surfaces preferential adjustable on-axis and independent adjustable off-axis. Light rays reflect off a beam splitter directly on to an object at nearly 90 °. With the DOAL’s coaxial (on axis) illumination, light rays reflect off a beam splitter directly on to an object at nearly 90 °.**

**Large Area LED Light Engines**

- **Area Array**
- **Brightfield**
- **Backlight**
- **Ringlights**
- **Dome**
- **DOAL**
- **CDI**
- **MAXlite**

**Backlight**

- Backlight is ideal for situations where high intensity, low power consumption, and compact size is required.

**Ringlights**

- Ringlights can deliver good results in situations where high intensity and low power consumption are required.

**DOAL**

- DOAL is designed for applications requiring a combination of lighting geometries.
Use the “A T-E-S-T” method to identify the effects of different lighting techniques on part features. Select a relevant feature of your part, then compare the effects of the various lighting techniques on that feature.

The goal is to select a lighting technique that creates the highest possible contrast between the feature of interest and its surroundings.

1) Surface absorption is effected by the color (spectrum) of illumination. Surface texture, elevation, shape and translucency are effected by the direction of illumination.

2) Uniformity of lighting increases in ascending order from Domes to SCDIs to CDIs.

3) Texture is both the presence of texture (matte, diffused, bumpy, rough) or its absence (shiny, specular, reflective, polished, smooth, glossy).

4) Using the opposite light spectrum will make a part feature appear darker. Using the same light spectrum will make a part feature appear lighter.

Examples:
- If the part feature you want to make darker is red, use a green light.
- Use a green light to make a green feature appear lighter.

### Table of Lighting Techniques and Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Technique</th>
<th>Description</th>
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<td></td>
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<td>None</td>
<td>Uniformity</td>
<td>Texture</td>
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<tr>
<td></td>
<td>Fiber Optic Ring Light</td>
<td>Diffused Dome light</td>
<td>Uniformity</td>
<td>None</td>
<td>Uniformity</td>
<td>Texture</td>
</tr>
</tbody>
</table>

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NERLITE Accessories

NERLITE accessories provide the customer with a complete lighting solution. Including the necessary power supplies and drivers, they provide the customer with numerous operation modes ranging from constant to strobe. They also provide the ability to adjust many lighting parameters to tackle the most challenging lighting and vision applications.

Examples:
- LED Lighting Controller: includes the power regulation, intensity control, timing, and triggering functions required for machine vision systems.
- LED Lighting Driver: stable constant current output for driving LED Lighting.
- Filter Thread Mount: Lens Adapter for "V2" Ring lights.

Note: Controllers do not supply power; a separate power source is required.

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