Auto ID & Machine Vision

Track, Trace, & Control Solutions

MICROSCAN®

Precision Data Acquisition
and Control Solutions

Precision Data Acquisition and Control Solutions

Microscan is a technology leader focused on precision data acquisition and control solutions serving a wide range of automation and OEM markets.

Data Acquisition and Control Solutions
We help manufacturers around the world drive down cost and waste, automate critical manufacturing process, and increase yields though data acquisition and control solutions.

From personal electronics to clinical instruments and car components, Microscan solutions enable critical production level applications such as quality control, work-in-process monitoring, guiding the movement of goods, component traceability, sortation, and lot tracking.

Precision
Microscan products are precision instruments. From tasks such as high speed barcode reading to high accuracy orientation, placement and coordinate checking through machine vision, Microscan products reliably perform complex data acquisition.

Technology Leader
Microscan has a strong history of technology innovation. We revolutionized the automatic identification (auto ID) industry In the early 1980s with the invention of the first laser-diode barcode scanner, and with the invention of the 2D symbology, Data Matrix.

Today, Microscan continues to be a recognized technology leader within the auto ID industry through continuous new product development in the areas of barcode reading and machine vision.

Three Reasons Microscan is a Global Technology Leader

(1) Our company was founded on technology innovation

- Inventor of the laser-diode barcode scanner
- Inventor of the 2D Data Matrix symbol
- Over 25 years of innovation in Auto ID and Machine Vision

(2) We continue technology leadership

- Long list of "firsts" for Auto ID and Machine Vision
- Others follow Microscan's new technology and product development

(3) We have unique patented technology solutions

- Hold over 90 technology patents in the U.S.
- More than 30 technology patents pending
- Extensive library of powerful machine vision algorithms and tools

Quality Focus
An ISO 9001:200 certified company since 1996, with national recognition for Quality Leadership, Microscan is proud of our quality record and our quality policy:

"We guarantee quality by maintaining established standards, encouraging innovation, and inspiring our employees to excellence. We are committed to the continual improvement of processes, products and services, and to the delivery of solutions that exceed customer expectations."

—Microscan Quality Policy

MICROSCAN®

Global Strength

Microscan is a preferred supplier to companies around the world. With multi-language websites and worldwide office locations, we offer comprehensive service and support, including online help, technical support, field services and multilingual documentation.

Microscan products are represented and supported through a global network of systems integration companies who specialize in automation solutions. The network includes more than 300 top automation integrators and value added resellers in over 30 countries, with technology specialization in specific sub-channels and complementary product lines.

Worldwide Microscan office locations:

- U.S. (Corporate Headquarters & Regional)
- Europe (Netherlands, Germany, Belgium, Turkey)
- China (Shanghai, Guangzhou, Beijing)
- Singapore
- South Korea
- Japan
- Mexico

■ Asia Pacific Headquarters

Contents Guide

Data Acquisition Technology

Auto ID and Symbologies

Linear or 1D barcodes have been in use since the 1970s and are the most common symbology type used for automatic identification part tracking. Today, increasing numbers of manufacturers are using two-dimensional (2D) symbols, such as Data Matrix, that offer greater placement flexibility and increased data capacity. Many industries specify the exact symbologies which must be used, and regulate their quality.

In addition, many manufacturers now practice "cradle-to-grave" traceability and permanently mark parts with a machine-readable symbol that is verified at each stage of the manufacturing process. Machine-readable symbols generally fall into the categories of linear barcodes, stacked symbols, 2D symbols, and Optical Character Recognition (OCR) fonts. A few examples of each are shown below.

Microscan provides fast, reliable reading solutions for all symbologies and OCR. Our products read any linear barcodes or 2D symbols printed or marked by any means.

1D and 2D Symbology Standards

- Automotive Industry Action Group: AIAG B4
  Parts Identification and Tracking
- Air Transport Association: SPEC 2000
  Electronic Commerce, Including Permanent Part ID
- U.S. Department of Defense: IUID
  Permanent & Unique Item Identification
- Electronics Industry Association: EIA 706
  Component Marking
- ISO/IEC 16022
  International Symbology Specification
- ISO/IEC 15418
  Symbol Data Format Semantics
- ISO/IEC 15434
  Symbol Data Format Syntax
- ISO/IEC 15415
  2D Print Quality Standard
- Society of Aerospace Engineers: AS9132
  Data Matrix Quality Requirements For Part Marking

Linear Barcodes


Code 128


Code 39


Pharmacode


Code 93


I2 of 5


UPC

Stacked Symbologies


PDF417


GS1 Databar (Stacked)


Micro PDF


GS1 Databar (Composite)

OCR Fonts

OCR-A
1234ABCD
Alphanumeric
(+4 currency char.)

OCR-B
1234ABCD
Alphanumeric
(+4 currency char.)

MICR E-13B
1234
Numeric
(+4 special char.)

SEMI M12
1234ABCD
Alphanumeric
(+4 currency char.)

2D Symbologies


Data Matrix


QR


Aztec

Data Matrix Size/Data Comparison Chart

Symbol Size	Data Capacity		5 mil Examples	7.5 mil Examples	10 mil Examples	15 mil Examples
Row x Column	*Numeric*	*Alphanumeric*				
10 x 10	6	3	1.27 mm	1.90 mm	2.54 mm	3.81 mm
12 x 12	10	6	1.52 mm	2.29 mm	3.05 mm	4.57 mm

Data Acquisition Technology

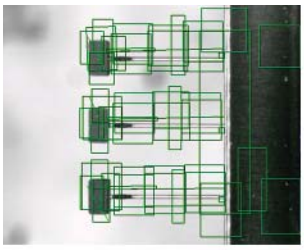
Vision Inspection

100% quality control in manufacturing reduces costs and ensures a high level of customer satisfaction. Machine vision inspection plays an important role in achieving this goal. While human inspectors working on assembly lines visually inspect parts to judge the quality of workmanship, machine vision systems use cameras and image processing software to perform similar inspections.

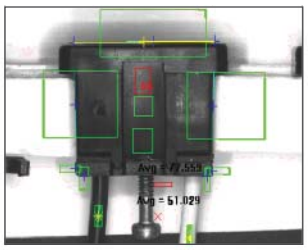
Machine vision inspection consists of narrowly defined tasks such as counting objects on a conveyor, reading serial numbers, searching for surface defects, and other examples detailed below. Manufacturers often prefer machine vision systems for visual inspections that require high speed, high magnification, around-the-clock operation, and/or repeatability of measurements. For example, semiconductor fabrication depends greatly on vision inspection technology, without which yields for computer chips would be significantly reduced. Machine vision systems inspect silicon wafers, processor chips, and subcomponents such as resistors and capacitors at high speeds with precision and accuracy.

Benefits

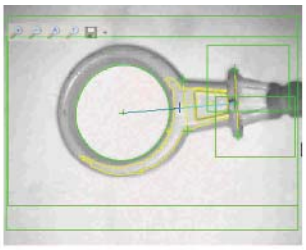
- **Quality Assurance**
  - Fewer rejects
  - Automatic visual inspection:
    Objective, fast, and reliable: Checks dimensional tolerances and shapes, detects whether parts are absent, checks correct mounting, position and completeness of parts, which can even be microscopically small (e.g. chip structures)
- **Increased Productivity**
  - Automatic component recognition:
    The components are assigned to different predefined categories on the basis of shape, dimension, patterns, codes and markings
  - Even suitable for use at high clock-pulse rates



Complex inspection, high speed



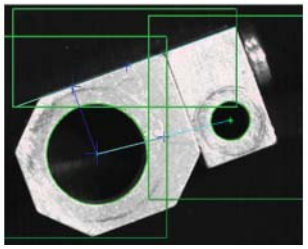
Check for completeness



Shape inspection

Pattern comparison

Measurement



Position/angle detection

Plain text reading, comparison

1D/2D symbol reading

Track, Trace, & Control

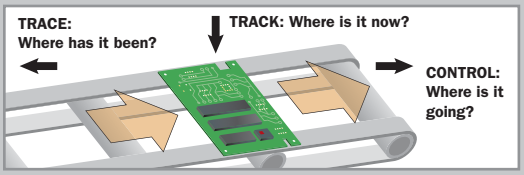
All industries – from automotive and electronics assembly to drug discovery and pharmaceutical packaging – depend on reliable automatic identification and machine vision to manufacture products. Few products can be produced without some form of auto ID or machine vision. The increasing need for higher production output at a lower cost places more stringent demands on manufacturing systems.

At Microscan, we help thousands of manufacturers around to world to drive down cost and waste, automate critical manufacturing processes, and increase yields. Microscan's precision data acquisition products and solutions will enable you to meet your track, trace, and control objectives in any application.

Industries Served:

- Electronics manufacturing
- Semiconductor manufacturing
- Aerospace manufacturing
- Clinical diagnostics
- Food and beverage packaging
- Contract manufacturing
- Dept. of Defense supply chain
- Document handling
- Automotive manufacturing
- Pharmaceutical packaging
- Drug discovery
- Kiosks
- And many more!

Enhanced Productivity Through Data



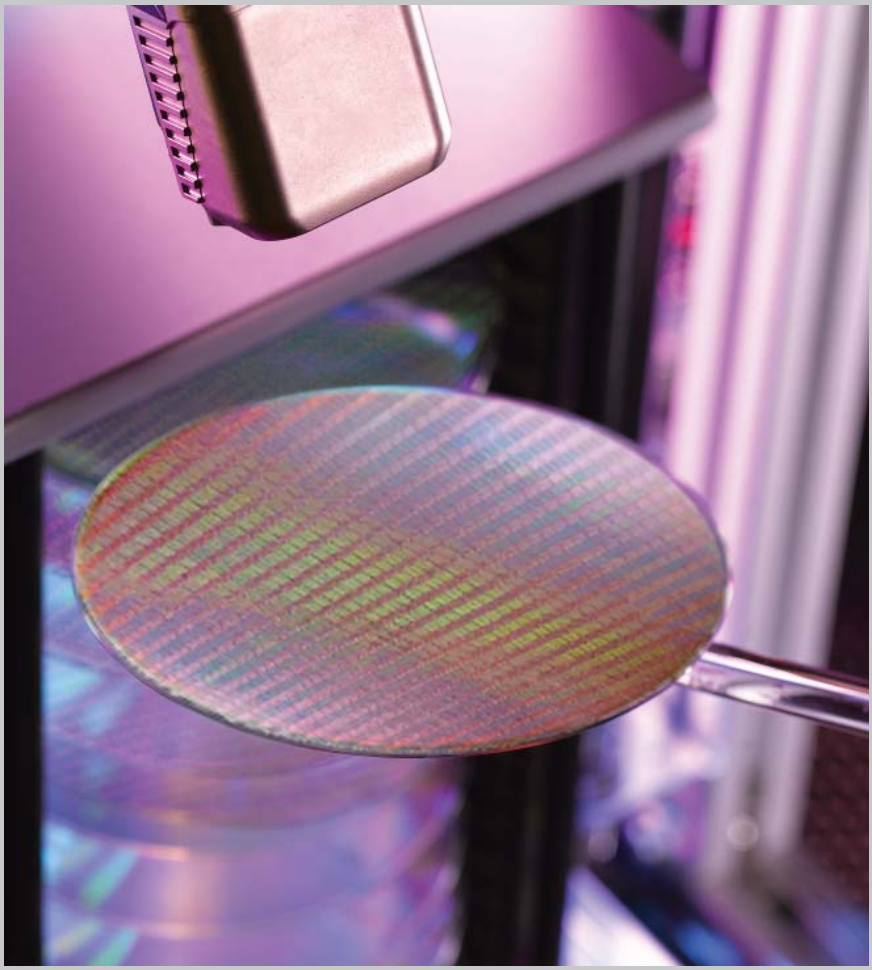
- **TRACK (Present)**
  Auto ID and machine vision are used to track parts that are work-in-process, or "WIP". Tracking specific parts and their locations provides critical data that plant floor managers use to maximize yield based on available capacity.

- **TRACE (Past)**
  Traceability is the ability to recreate or "trace" the manufacturing steps, processes, or location of a part before it becomes a completed assembly. Item level traceability is critical because it allows for quick containment of parts that may have undergone suspect or incorrect manufacturing processes.

- **CONTROL (Future)**
  Control is used to decide what step or future process a part must undergo. Machine vision inspection is a key element in many quality control processes and ensures that parts that do not meet exacting standard are rejected before moving further into the supply chain.

Industry solutions

Focus on Electronics



Industry leaders within electronics and semiconductor manufacturing need to enable lean manufacturing, assure quality, and optimize efficient use of resources.

Microscan products help these companies to maximize quality, productivity, and efficiency through diverse applications such as:

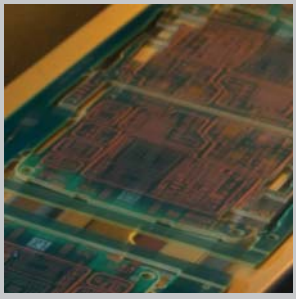
Auto ID Tracking & Traceability

- Printed circuit board traceability
- Sub-assembly tracking
- Traceability through SMT processes
- Quality assurance
- Semi-back wafer tracking

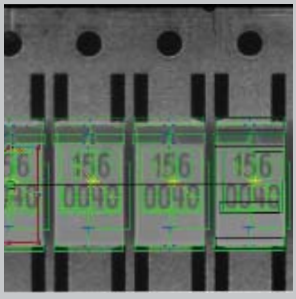
Machine Vision

- Wafer positioning
- Location & alignment for pick and place
- Color matching
- Ball grid array inspection
- Die attach bond inspection
- Measure solder paste levels
- Robotic guidance

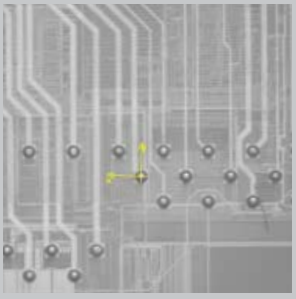
Application Examples



- Reading and verification of marked Data Matrix



- High speed, multi-camera inspection of defects



- Dimensional check inspection

- Reading Data Matrix and Optical Character Recognition (OCR)

Industry solutions

Focus on Life Sciences

Data accuracy and reliability are critical within life sciences industries where manufacturers need to increase throughput while meeting regulatory compliance.

Microscan helps manufacturers throughout clinical diagnostics, drug discovery, medical devices, and pharmaceutical industries in diverse applications such as:

Auto ID Tracking & Traceability

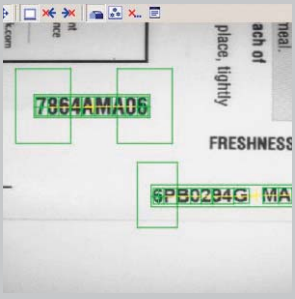
- Sample tracking
- Date and lot tracking
- Medical device tracking
- Test level traceability
- Vial reading verification

Machine Vision

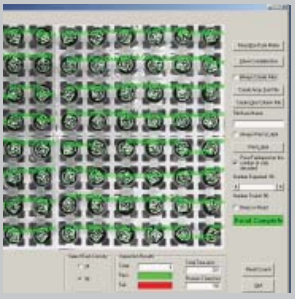
- Color detection
- Robotic guidance
- Test tube cap and color inspection
- Inspect package integrity
- Dimensional gauging
- Measure fill levels and sealings

Application Examples

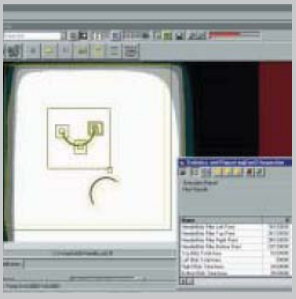
- High speed reading of long linear barcodes



- Advanced Optical Character Recognition (OCR) and Verification (OCV) capabilities



- Reading 96 Data Matrix in a single capture



- Detailed inspection of small parts and components

Industry solutions

Focus on Automotive

Automotive suppliers and OEMs today rely on data tracking for quality assurance, spill prevention, error proofing, reduction of costly reworks, and increasing production yields.

Microscan helps these companies assure quality and increase productivity through diverse applications such as:

Auto ID Tracking & Traceability

- Parts traceability
- WIP tracking
- Spill prevention and containment
- Build-sheet reading
- Verification

Machine Vision

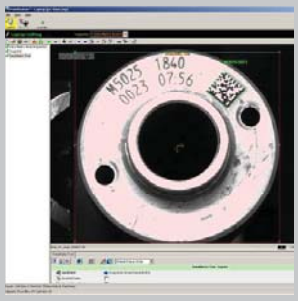
- Placement verification
- Error proofing and assembly validation
- Sorting parts
- Dimensional gauging
- Quality assurance
- Robotic guidance

Application Examples

- Reading and verification of marked Data Matrix

- WIP verification

- Dimensional check inspection



- Inspection of parts and components

Product Portfolio

Auto ID Barcode Readers

From small products for embedded OEM applications to rugged readers for industrial use, Microscan offers a wide range of quality products to read linear barcodes and stacked symbols, with features such as high speed reading, wide field of view, symbol reconstruction, and aggressive decoding technology.

Embedded Reader Series

- **MS-1**
  Smallest fully decoded scan engine in its class.

- **MS-2**
  Compact CCD reader is available in several configurations to meet a variety of needs.

- **MS-3**
  Compact laser scanner offers high performance decoding and wide scan angle.

- **MS-9**
  Laser scanner offers ultra-fast decode performance.

Industrial Scanner Series

- **MS-860**
  Laser scanner with intelligent sweeping raster and auto-calibration.

- **MS-890**
  Heavy duty laser scanner with extended read range, auto focus, and sweeping raster.

- **QX-830**
  Compact laser scanner features QX Platform, industrial connectors, and optional embedded Ethernet protocols.

QX Platform provides high performance connectivity, networking and decoding in any automated industrial environment.

Quick Connect: Includes M12 Ultra-Lock™ connectors and cordsets for plug-and-play set up of single or multi-reader solutions.

X-Mode: X-Mode symbol reconstruction provides decoding of damaged, poorly printed, or poorly aligned linear barcodes.

Product Portfolio

Auto ID 2D Fixed-Mount Readers

Our 2D fixed-mount readers feature the latest technology for decoding both 2D symbols and linear barcodes. Specialty readers are available for high speed reading, ESD-sensitive applications, and decoding the most challenging direct part marks (DPM).

Quadrus® MINI Series

- **Quadrus MINI**
  Miniature imager with wide field of view and real time autofocus. ESD-safe and three megapixel models are available.

- **Quadrus MINI Velocity**
  High speed miniature imager with dynamic autofocus.

HawkEye® 1500 Series

- **HawkEye 1510**
  Flexible reader with multiple C-mount lens and lighting options.

- **HawkEye 1515**
  Universal reader for the broadest range of direct part mark reading applications.

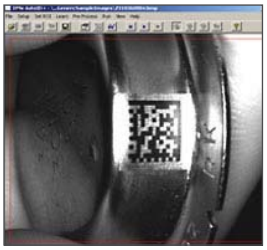
- **HawkEye 1525**
  Specializes in DPM reading with darkfield illumination, typically used for highly reflective parts.

Quadrus® Readers

- **Quadrus EZ**
  Exceptionally easy to use and is available in multiple focal distances.

Software

- **DMx Auto ID+**
  Barcode reading system for all standard linear barcodes, 2D symbols, and OCR (text recognition).



Product Portfolio

Auto ID 2D Handhelds and Verifiers

Our Auto ID products include verifiers and handheld 2D readers featuring the latest technology for decoding symbols and verifying their quality. Handheld readers are ideal for any track, trace, or control application. Symbol verification ensures only the highest quality marks enter the supply chain, to help guarantee successful traceability implementation.

Handheld Reader Series

- **HawkEye® 40T**
  Ideal for reading the most challenging direct part marks.

- **HawkEye® 45T**
  Includes an integrated screen to display decode data and allow easy configuration.

- **MS-Q Quadrus®**
  Decoding capabilities include high density linear and 2D symbols.

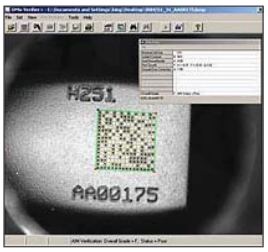
Verifier Series

- **DPM Verifier**
  UID Compliance Verifier designed for verifying direct part marks.

- **LDP Verifier**
  UID Compliance Verifier designed specifically for labels and data plates.

- **Quadrus® Verifier**
  Factory floor ready verifier for general verification needs.

- **DMx Verifier+**
  Verification software system supplies information on Data Matrix quality.



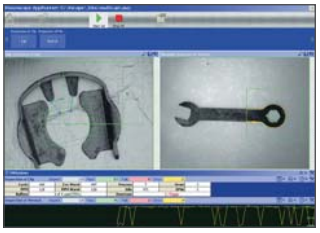
Product Portfolio

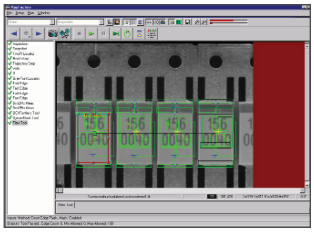
Machine Vision Systems

Microscan offers a comprehensive line of machine vision system solutions, with total scalability from integrated systems to PC-based components. With the feature-rich Visionscape® software platform, these machine vision products provide a broad range of vision capabilities.

Visionscape® Solutions

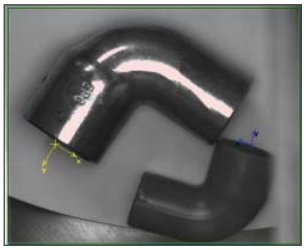
- **Software:**
  Extensive collection of proven image processing tools and powerful graphical user interface.





- **Integrated System:**
  HawkEye® 1600T
  Series of smart cameras with broad applicability, versatility, and proven performance of Visionscape software.

Intellifind Option
Select camera models include Intellifind tool for robust object detection and pattern recognition.



- **PC-Based Boards:**
  Frame Grabbers
  Capture images from a variety of machine vision cameras into the host PC memory.

- **PC-Based Boards:**
  Vision Processors
  Complete high performance vision systems in a single PCI slot.

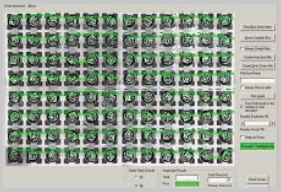
Product Portfolio

Industry Solutions

Microscan can custom design and precisely engineer auto ID and machine vision solutions for a variety of industry needs. Some examples are listed below. For specific needs that our general product line does not address, contact us about custom solution development.

- **EZ Match Color**
  Ultra-compact reader provides clinical life sciences applications with test tube cap inspection and color detection.

- **MS-96 Vial Reader**
  High speed system specifically designed to decode Data Matrix symbols on 24 or 96 vials.



- **DM Detective**
  Presentation reader specializes in reading difficult Data Matrix symbols on instruments, tools, or other small items.

- **Quadrus® MINI ESD Safe**
  ESD-safe miniature imager designed for use in the assembly and manufacture of sensitive electronic components.

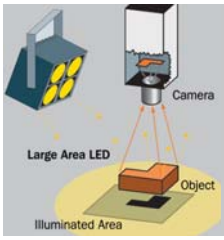
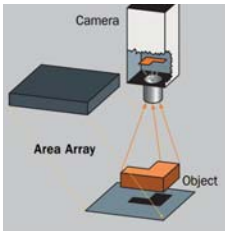
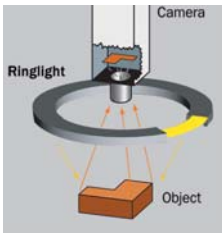
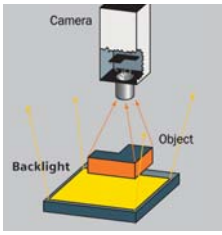
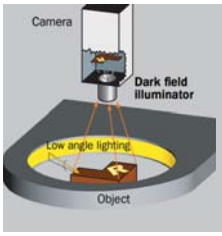
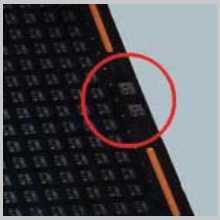
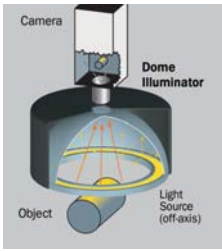
- **UID Solutions**
  Allow compliance with the U.S. Dept. of Defense (DoD) mandated Unique Identification (UID) policy in accordance with MIL-STD-130 and DFAR 252.211-7003.

- **Visionscape® I-PAK®**
  Proven choice for pharmaceutical applications requiring inspection, date and lot tracking, symbol verification, and more. I-PAK is 21 CFR Part 11 compliant.

Product Portfolio

Machine Vision Lighting

Microscan is the leading manufacturer of lighting and imaging systems designed specifically for machine vision. These precision NERLITE® products allow machine vision and auto ID systems to perform reliably in any imaging application.

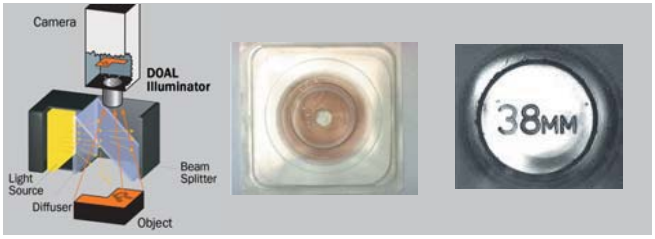
		LIGHT IN USE	OBJECT	RESULTING IMAGE
NERLITE Large Area LED Light–LALL™ For illuminating small to very large areas or when very high intensity is required, and suitable for indoor or outdoor use.				
NERLITE Area Array Illuminator Designed for nonspecular surface lighting in applications that demand economical solutions.				
NERLITE Ring Illuminator Economical and practical choice for illuminating diffused or specular surfaces.				
NERLITE Backlight Provides sharp contrast to outline a part's shape, hide clear housings, and view openings such as drilled holes.				
NERLITE Dark-Field Illuminator Dramatically enhances the contrast of surface features such as laser embossed or engraved marks or surface defects.				
NERLITE Dome Illuminator Provides practical and cost effective solutions to illuminate shiny, bumpy surfaces.				

Product Portfolio

Machine Vision Lighting

LIGHT IN USE **OBJECT** **RESULTING IMAGE**

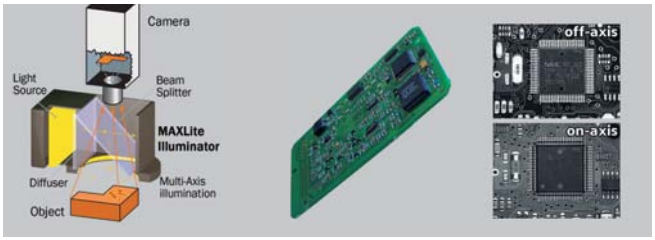
■ **NERLITE DOAL®**
Provides diffuse, uniform illumination for flat, specular surfaces. DOAL modules offer collimated illumination within the camera's optical path.



■ **NERLITE SCDI®**
Provides extraordinary diffuse illumination. Their patented design is ideal for moderately faceted and undulating specular surfaces.

■ **NERLITE CDI®**
Patented optics and precision integrated sphere technology yield a self-contained continuous diffuse light unrivaled in this industry.

■ **NERLITE MAXlite**
Multi-Axis Illuminators are designed for applications requiring a combination of lighting geometries.



Product Portfolio

Accessories for Auto ID and Machine Vision

Auto ID Accessories

- **QX-1**
  Complements and streamlines installation of QX Platform products. Features Quick Connect system with M12 Ultra-Lock connectors and IP65 sealing.

- **Connectivity**
  Efficient connectivity and communication tools are available for use within any auto ID application.

- **Interface Devices**
  Interface devices simplify connecting to readers by providing separate ports for the host, power supply, trigger, and network.

- **Cables and Mounting**
  Variety of cables, mounting hardware, power supplies, and other accessories are available.

Machine Vision Accessories

- **Cameras**
  Analog VGA and SXGA cameras are available and support C-mount lenses.

- **Lenses**
  Standard C-mount lenses, filters, and spacers are available for use with either an external camera or with the HawkEye 1600T and 1510.

- **I/O Modules**
  Enable the use of discrete inputs and/or outputs with a PC that has Visionscape boards installed.

- **Cables and Mounting**
  Complete selection of cables, mounting hardware, power supplies, calibration targets, and other accessories are available for vision applications.

Visit our websites for complete information on Microscan products, specifications, and applications.

www.microscan.com
Corporate information, full product line, case studies and more

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Resource for 2D symbol reading and miniature imagers

www.smallscanners.com
Resource for embedding barcode readers into equipment

www.uidsupport.com
Resource for DoD and UID reading and verification solutions

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