

Logistics



Applications Guide



AB&R
Identify. track. manage.

COGNEX

The Right Choice for Logistics Applications



Cognex image-based ID readers help logistics companies increase productivity and lower costs by improving material handling equipment efficiencies, reducing the need for manual sortation and decreasing equipment downtime.

The key to achieving this increased productivity, is by using Cognex image-based barcode readers that provide consistently higher read rates than laser scanners. DataMan 500 series of products read 1-D or 2-D codes presented in any direction at high speeds for postal, parcel and package sortation and are ideal for presentation scanning. The DataMan 300 series of products read 1-D barcodes on high speed tote scanning and print and apply lines.

Cognex is the world's most trusted vision company, with 700,000+ systems installed in facilities around the world, and over thirty years of experience focused on vision and ID technology. We have the experience and application knowledge to ensure that our systems do exactly what is needed, every time.

Global Leader, Local Expertise, Worldwide Reach

Globalization of retail markets is putting increased pressure on logistics companies. Goods need to be picked and shipped faster every day, order volumes are increasing rapidly, and shipping mistakes can be very costly. Barcode reading applications are increasingly critical to all logistics operations. Improving and maintaining reader performance requires innovative thinking, hard work, and a like-minded supplier that's able to deliver and support systems at multiple locations across the globe.



Cognex ID products are used by many of the world's top manufacturers, distributors and material handling integrators to ensure that their

receiving, picking, packing and shipping operations meet or exceed performance requirements.

Every day leading retailers and distributors rely on Cognex sales engineers and 450+ partners located around the world to provide assistance wherever and whenever needed.

ID Application Categories:



1-D High Speed



1-D Low Speed



2-D Direct Part Mark



2-D Printed

CONSUMER PRODUCT DISTRIBUTION
Shipping label verification



TECHNICAL SPECIFICATIONS	
Application type:	Top side automated scanning
Barcode:	Multiple Code 128 barcodes
Barcode x-dimension size:	13 mil
Conveyor belt width:	26 cm
Required depth of field*:	18 cm
Conveyor speed:	0.8 m/s

*difference between tallest and shortest package



APPLICATION

A distribution company needed to read and verify shipping labels that had been automatically applied to shipping bags.

The shipping conveyor was moving at a speed of 0.8 meters per second and was capable of processing 1200 bags per hour.

If an error is detected or if a barcode is unreadable then a trigger system pushed the package off the line for an operator to address.



SYSTEM

DataMan 500

RESULTS

Several barcode reader options were evaluated to solve this application but ultimately the DataMan 500 was selected because it provided higher read rates.

This application was challenging because the shape of the bags varied significantly depending on shape and size the object inside. This affected how barcodes were presented to the reader and created problems for the competitive barcode reading systems.

BEVERAGE DISTRIBUTION
Verifying tax stamps



TECHNICAL SPECIFICATIONS	
Barcode:	UPC barcode
Barcode x-dimension size:	10 mil
Conveyor speed:	1 m/s
Reads per second:	25-30 bottles



APPLICATION

A liquor wholesale company needed to apply and verify tax stamps to liquor bottles before they could be sold to restaurants and retailers.

The stamp application was automated and the tax stamps included destination specific information encoded within the barcodes.

These barcodes needed to be read and recorded in a database as documentation that taxes were properly paid for the item.



SYSTEM

DataMan 500

RESULTS

The DataMan 500 was selected for this application because of its ability to read barcodes reliably even when the background of the barcode changes drastically.

With the large variation of bottle shapes, label colors and light reflective properties, this application provided significant challenges.

However the DataMan 500 was able to achieve greater than 99% read rates.

RETAIL DISTRIBUTION

INDUSTRIAL PRODUCT DISTRIBUTION
Small package sorting



TECHNICAL SPECIFICATIONS	
Application type:	Top side automated scanning
Barcode:	Multiple Code 128 barcodes
Barcode x-dimension size:	13 mil
Conveyor belt width:	31 cm
Required depth of field*:	15 cm
Conveyor speed:	0.5 m/s

*difference between tallest and shortest package



APPLICATION

A distributor of small parts needed to sort a variety of items including boxes up to 30cm high, flat plastic packages and hand tools wrapped in plastic.

1-D barcode labels were applied by hand to each item and may be under a plastic wrap.

The conveyor system ran at approximately 0.5 meters per second and the data in the barcode directed the item to the correct shipping location.

Failed barcode reads meant that an operator must manually sort the item.



SYSTEM

DataMan 500

RESULTS

This application was challenging because the shape of the bags varied significantly depending on the shape and size of the object inside.

Several barcode reader options were evaluated to solve this application but ultimately the DataMan 500 was selected because it provided the highest read rates.

RETAIL DISTRIBUTION

RETAIL DISTRIBUTION
Sorting of perishable frozen food packages



TECHNICAL SPECIFICATIONS	
Application type:	Multiple sided automated scanning
Barcode:	Code 128
Barcode x-dimension size:	13 mil
Conveyor belt width:	45 cm
Required depth of field*:	8 cm
Conveyor speed:	1 m/s

*difference between tallest and shortest package

APPLICATION



A frozen food distribution company needed to verify the accuracy of orders picked for shipment to markets.

Food was shipped in corrugated packages with labels on either the leading or trailing face.

The scanning system needed to read the label regardless of the side the label is applied and send the data to the control system via a single RS-232 connection.

Boxes were also spaced very close together requiring the reader to work at extreme perspective angles for both ladder and picket fence oriented barcodes.

SYSTEM



DataMan 500

RESULTS

The DataMan 500 was used to solve this application because of its ability to read barcodes at high angles of perspective. This reduced the total number of scanners required to solve the application. The ability to connect multiple readers via a Master/Slave configuration over Ethernet simplified the scanner installation.

RETAIL DISTRIBUTION

RETAIL DISTRIBUTION
Reading inkjet codes on darker cardboard



TECHNICAL SPECIFICATIONS	
Application type:	Multiple sided automated scanning
Barcode:	Code 128
Barcode x-dimension size:	13 mil
Conveyor belt width:	45 cm
Required depth of field*:	8 cm
Conveyor speed:	2.5 m/s
Number of cameras in Master/Slave configuration:	2

*difference between tallest and shortest package

APPLICATION



A pet food distribution company needed to sort products for shipment using an inkjet barcode printed on corrugated cardboard.

The existing laser based scanning equipment was struggling to read the barcodes when the color of the corrugated material changed from light to dark.

This forced the user to adjust the scanners frequently and sort a large amount of product manually.

SYSTEM



DataMan 300

RESULTS

The DataMan 300 successfully read all of the customer's 'worst case' barcodes at high speed.

Adjustment of the readers was no longer required and manual sorting of packages due to "no-reads" and incorrect reads were virtually eliminated.

RETAIL DISTRIBUTION

RETAIL DISTRIBUTION
Dynamic reading of Code 128 and UPC codes on boxes in low light



TECHNICAL SPECIFICATIONS	
Application type:	Automated side scanning
Barcode:	Inkjet Code 128 and UPC on label
Barcode x-dimension size:	20 mil code 128 and 13 mil UPC
Required depth of field*:	15 cm
Required vertical field of view:	23 cm

*difference between tallest and shortest package



APPLICATION

A food packaging company needed to verify Code 128 barcodes inkjet printed directly onto brown cardboard cases to confirm they matched the product being run on the line.

The challenges with the application were the low contrast and the distorted shape of the printed codes.

In a second application on the same production line, pre-printed UPC codes were read on frozen prepared meal boxes before they were loaded to the cartons, again to ensure that they matched the product being run.



SYSTEM

DataMan 500

RESULTS

The DataMan 500 delivered higher read rates for both the low contrast codes on the cartons and also for the UPC codes on the meal boxes in a very low light environment.

Standard tools in the Cognex Connect™ suite made it easy to set up EtherNet/IP communication with Rockwell PLCs on the production line.

RETAIL DISTRIBUTION

RETAIL DISTRIBUTION
Reading 1-D barcodes dynamically with perspective and distortion



TECHNICAL SPECIFICATIONS	
Application type:	Automated Side Scanning
Barcode:	Code 128 and Code 39
Barcode x-dimension size:	13 mil
Required depth of field*:	20 cm
Required vertical field of view:	18 cm
*difference between tallest and shortest package	

APPLICATION

- A wine and spirits distributor picked, packed and shipped products by reading Code 128 barcodes on a high speed conveyor. Once read, the barcode information was used to drive an automatic sorter. High read rates were critical for the efficient operation of the sorter and to avoid manual resorting.

This application was made more complex because many of the cartons were re-used for custom orders and packing tape often covered part of the inkjet printed barcodes.



SYSTEM

- DataMan 500



RESULTS

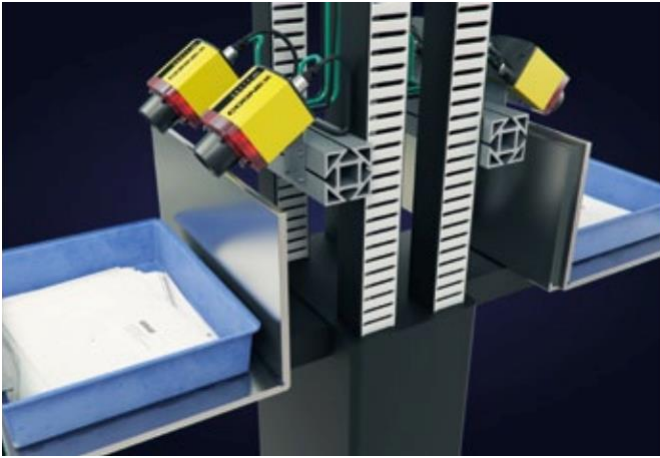
- DataMan 500 was selected for this application to overcome issues with reading barcodes with perspective distortion and because it could read the codes on the labels even when translucent packing tape partially obscured the label. The DataMan 500 also achieved higher read rates than the competitors.

Unlike the competitors, the DataMan 500 could read the code even when packing tape obscured the label.

In addition the 20cm depth of field was easily handled by the DataMan 500.

RETAIL DISTRIBUTION

PARCEL
Reading multiple 1-D barcodes



TECHNICAL SPECIFICATIONS	
Application type:	Manual Presentation Scanning
Barcode:	Code 128 and Code 39
Barcode x-dimension size:	15 mil
Number of cameras in Master/Slave configuration:	2

APPLICATION



A courier service used laser based presentation readers to scan 1-D codes on packages as part of a weight checking process. This allowed the company to verify the package weight originally entered by the shipper and adjust it when necessary.

However, it was only possible for them to re-weigh a fraction of the total volume of packages that passed through the sorting facility each day because of the speed of this process.

Any improvement to the speed and efficiency of this process directly impacted revenue by improving the accuracy of shipping charges.

SYSTEM



DataMan 500

RESULTS

By switching to the DataMan 500 the customer was able to improve throughput by over 65% compared to using laser scanners.

The DataMan solution allowed the operators to move packages through the scan area quickly and eliminated the need to carefully position the barcode.

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RETAIL DISTRIBUTION
1-D code reading and verification of label application at high speed



TECHNICAL SPECIFICATIONS	
Application type:	Side scanning
Barcode:	Code 128
Barcode x-dimension size:	15 mil
Required vertical field of view:	15 cm
Conveyor Speed:	2.8 m/s

APPLICATION



A sporting goods chain used a print and apply verification scanner to confirm the label application and readability of the barcode on boxes. The label was applied to the side of the box prior to sorting. The speed of the sorter could reach up to 2.8m/sec.

The existing laser scanners delivered inconsistent read rates averaging only 97% and were nearing the end of their life as performance was continuing to degrade.

The customer was looking for a high speed solution and better read rates to increase throughput and productivity, so the DataMan 300 was tested for one month in one of four distribution centers.

SYSTEM



DataMan 300

RESULTS

The image-based DataMan 300 system optimized read rates, which improved to 99.5%.

With the standard DataMan interfacing tools it was also possible to replace the old readers without any control system modifications being required. This was seen as a key benefit by the customer.

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POSTAL

Envelope content and addressing validation



TECHNICAL SPECIFICATIONS	
Application type:	Top side automated scanning
Barcode:	QR Code
Barcode x-dimension size:	20 mil
Conveyor belt width:	75 cm
Required depth of field*:	2 cm
Conveyor speed:	1.5 m/s

*difference between tallest and shortest package



APPLICATION

- A retail distribution company needed to sort mail order catalogs for shipment.

Each printed catalog had a unique number containing information about the place of delivery and its manufacturing code.

The 2-D codes verified the number of catalogs produced.

They were also used for final sorting and packaging of the catalogs according to their final destination (i.e., city, street, names).

The customer was looking for a 2-D code reader which would increase their production speed, achieve higher reading rates than their current scanner and support their continuous improvement efforts aimed at minimizing the cost of catalog distribution.

SYSTEM



DataMan 500

RESULTS

The DataMan 500 delivered higher read rates, a wider range of communication options and was easy to install.

Cognex's wide product portfolio was also an important factor for the customer as they plan to install In-Sight OCR systems in the future.

The DataMan 500 provided the ideal combination of resolution, field of view and reading speed for this application. It was also able to handle the variation in size and shape of each type of magazine and catalog.

POSTAL

POSTAL
Identify and read a single 1-D/2-D code among multiple code labels



TECHNICAL SPECIFICATIONS	
Application type:	Manual presentation scanning
Barcode:	Code 128 and Data Matrix
Barcode x-dimension size:	10-15 mil
Required field of view:	15 cm

APPLICATION



The company operated a fast growing lightweight packing, sorting and delivery operation with a high speed manual mail sorting station.

Each package contained 1-3 codes per label, with a combination of 1-D and 2-D codes. Packages were manually retrieved from a bin, scanned and then placed on a conveyor once all the codes had been read.

The existing solution used handheld readers that required multiple read attempts for each code.

SYSTEM



DataMan 500

RESULTS

The DataMan 500 solution dramatically increased efficiency with hands free operation, faster reading of multiple codes in the same image and higher read rates.

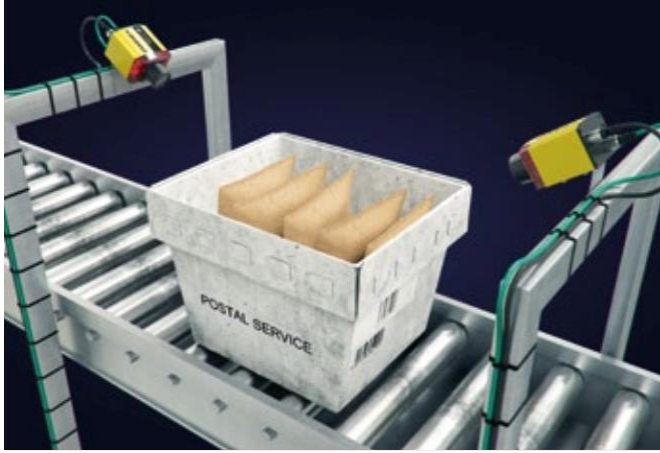
Because the barcode readers were now hands free, packages were handled more efficiently. Handheld reader handling damage and frequent cable replacements were also eliminated.

Cognex was able to support a live trial at the start of the project so that operators could provide feedback about the benefits of the DataMan 500 solution directly to their management.

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POSTAL

Reading printed labels on opposite faces, triggering off photoeye in burst mode



TECHNICAL SPECIFICATIONS	
Application type:	Leading and trailing side scanning
Barcode:	Code 128 and Interleaved 2 of 5
Barcode x-dimension size:	15 mil
Conveyor belt width:	23 cm
Conveyor Speed:	0.75 m/s

APPLICATION



A postal service customer needed to read printed labels on mail sorter trays. The trays were moving at high speed and the codes could be on either end of the tray.

Due to mounting restrictions and the height of the trays, the codes viewed by the DataMan readers suffered extreme perspective distortion.

Two codes were read on each tray: one was a Code 128 and the second was a i2of5 code. The read was triggered by a photoeye.

SYSTEM



DataMan 500

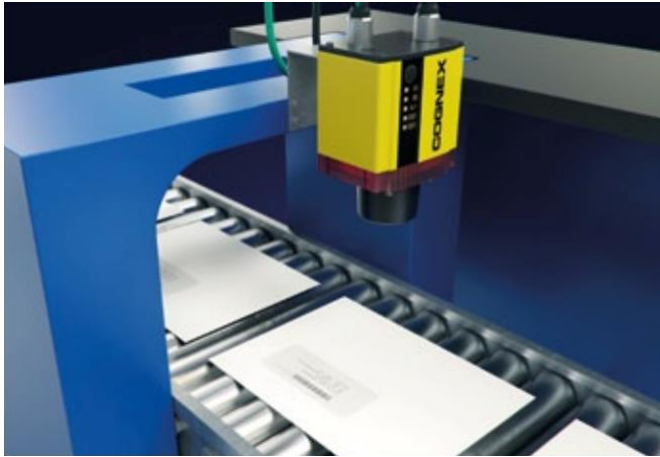
RESULTS

The DataMan 500 provided quick setup, all-in-one design, high read rates, Ethernet connectivity and speed.

The previous scanner needed a slowdown (buffer conveyor) through the reading station. This requirement was eliminated with the DataMan 500 system, increasing throughput, simplifying the handling system and reducing maintenance costs.

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POSTAL
Reading EAN128 and 2-D codes through different sized window envelopes



TECHNICAL SPECIFICATIONS	
Application type:	Automated top side scanning
Barcode:	Code 128 and Data Matrix
Barcode x-dimension size:	7-10 mil
Required vertical field of view:	16 cm
Conveyor Speed:	3 m/s

APPLICATION



The customer built letter sorting machines to read EAN128 and 2-D codes through a plastic window on three different sized envelopes.

The letters moved at 3 meters per second.

SYSTEM



DataMan 500

RESULTS

The DataMan 500 was selected due to the high read rates achieved, despite having to read the codes through uneven and reflective plastic windows.

The DataMan 500 delivered better read rates than the competitive products and fast decoding. It was also much easier to use and faster to install with no programming required.

The DataMan 500 eliminated the need for a PC on the line and provided direct Ethernet connectivity to the plant data system.

POSTAL

The Cognex Product Family



Fixed-Mount Industrial ID Readers

DataMan readers offer the smallest size and highest performance in direct part mark and high-speed code reading applications. Reading everything from simple barcodes to the most challenging 2-D codes, DataMan readers are equipped with autofocus and Ethernet capability for ease of networking to factory platforms.



Handheld Industrial ID Readers

DataMan offers the widest range of industrial handheld readers in the industry. Innovative lighting, image acquisition and code reading capabilities provide the most reliable reading of virtually any code on any surface.



Code Verifiers

Handheld and fixed-mount DataMan verifiers are easy-to-use, reliable and enable accurate evaluation of code quality to ensure the highest read rates through production and the supply chain.



Vision Systems

Rugged systems provide easy-to-use interface for configuring applications in a fully integrated package. In-Sight vision systems are ideal for inspection, text verification, and track and trace. A wide range of models, including line scan and color systems, meet all price and performance requirements.



Vision Software

A library of powerful vision tools allows complete flexibility in choice of cameras, frame grabbers, and other peripherals. VisionPro® software combines the power and adaptability of advanced programming with the simplicity of a graphical programming environment.



Vision Sensors

Easy, affordable sensors replace photoelectric sensors for more reliable inspection and part detection. Checker® vision sensors succeed where traditional sensors fail, and allow multiple inspections with a single device.



AB&R is a certified Cognex Partner. For more information on products and services. Contact an AB&R Specialist 800-281-3056 or visit www.abr.com

COGNEX Companies around the world rely on Cognex vision and ID to optimize quality, drive down costs and control traceability.
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