

10 Reasons to Choose Image-based ID Readers

White Paper

COGNEX

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INTRODUCTION

Image-based ID readers stand poised to replace laser scanners in a wide range of industries including food, beverage, consumer goods, pharmaceutical and automotive, but when considering a transition from laser scanners to image-based barcode readers many think the cost too high.

Thanks to advances in microprocessors, imaging sensors and decoding algorithms, image-based ID readers have become not only more affordable, but also more powerful.

Today's most advanced image-based ID readers have overcome the technical and economic hurdles and now offer a more attractive alternative to industrial laser scanners on the factory floor.

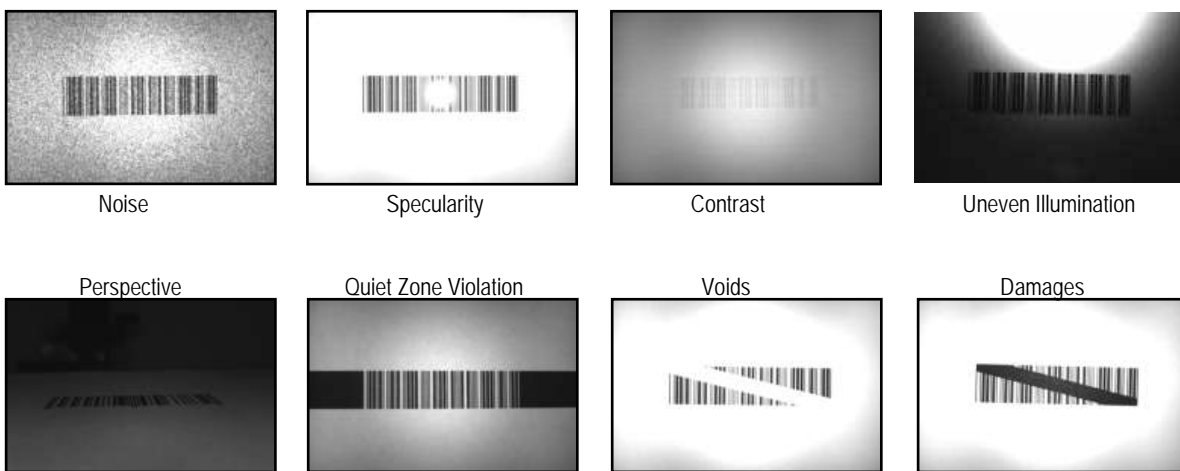
In use, the latest generation of image-based ID readers has proven to actually outperform lasers in the following areas:

1. Read rate performance
2. Long-term reliability
3. Omnidirectional code reading
4. 2D code reading
5. Multiple code reading and output capability
6. Image archiving
7. Ease of setup and deployment
8. Barcode quality feedback
9. Visualization and communication
10. Future proof

When considering the transition from laser scanners to image-based barcode reading, it's important to consider the many advantages they offer.

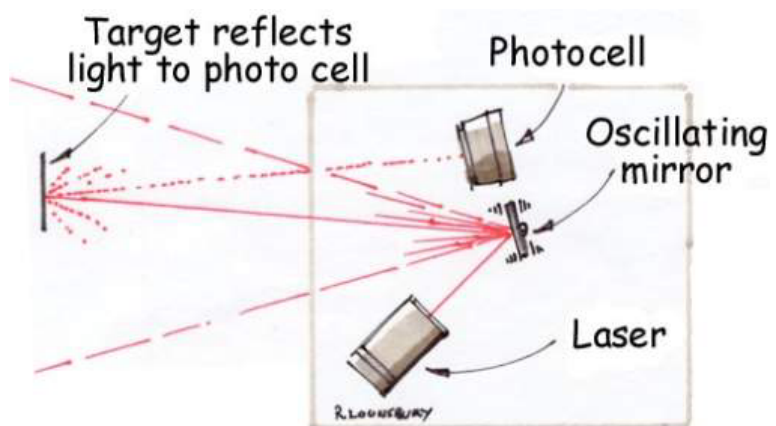
1. READ RATE PERFORMANCE

The most important way to rank barcode reader performance is by its read rate. Read rate is the number of barcodes read divided by the number attempted. It's usually expressed as a percentage and the closer to 100% the better. Said another way, read rate is the best measure of how reliable and robust the reader is to the barcodes seen on the factory floor. Image-based readers view the entire barcode, not just a single line, so they can use advanced algorithms to overcome quiet zone violations and other code damage issues that cause laser scanners the most trouble on the production line. In addition, Image-based readers are able to use light sources to read codes that lasers cannot see, including barcodes printed with UV ink. In this way, image-based readers achieve much higher read rates, even with the most challenging codes that laser scanners do not read:



2. LONG-TERM RELIABILITY

Laser scanners use an oscillating scan mirror to move the laser beam rapidly across the barcode, creating the laser line that reads the code. Image-based readers have no moving parts, which mean they are less likely to have mechanical failures. Typically packaged in industrial enclosures, image-based readers are designed for long term reliability and low maintenance.



3. OMNIDIRECTIONAL CODE READING

Image-based readers are able to read barcodes in any orientation within a single view. In contrast, it often requires multiple laser scanners configured together to read barcodes in applications where orientation is not repeatable. Image-based readers not only handle the typical ladder or picket fence orientation of barcodes, but also are able to locate and read barcodes in any orientation.

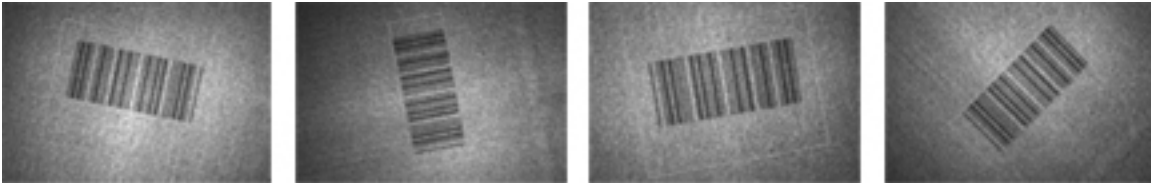


Image-based readers are able to decode 1D barcodes in any orientation from 0 to 360 degrees

4. 2D CODE READING

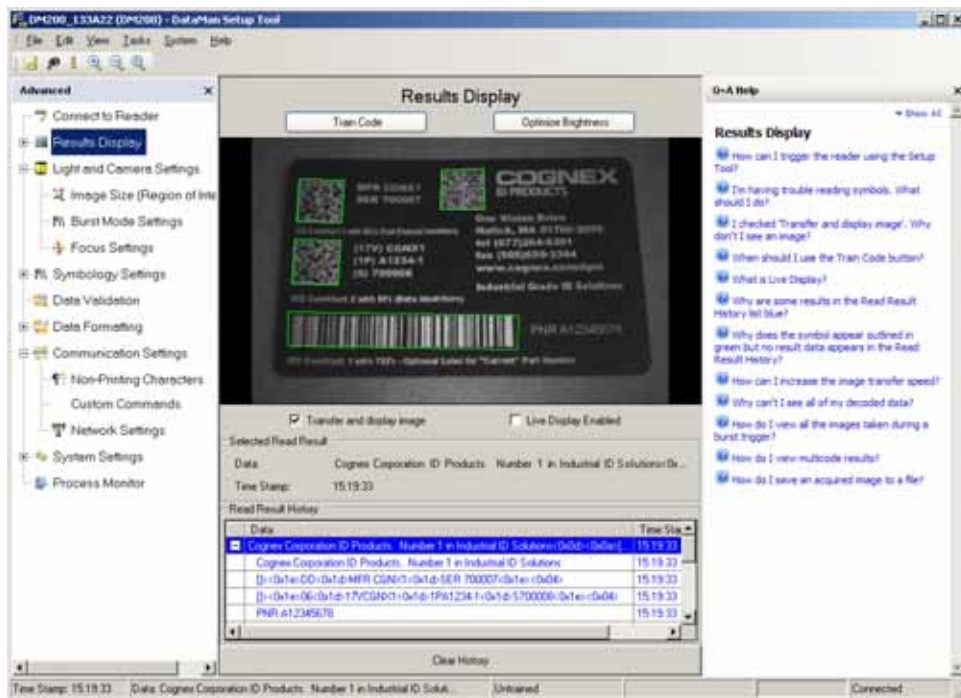


Many industries are making the transition to 2D codes, such as Data Matrix or QR Codes. More information can be encoded in 2D codes to help with product traceability throughout the manufacturing process and the supply chain., Often, 2D codes are used in conjunction with 1D barcodes in the production process however, laser scanners, can't read Data Matrix or QR codes. In contrast, image-based readers can robustly and reliably read 2D codes as well as 1D barcodes. In fact, image-based readers are often designed to read the most difficult to read 2D codes that are directly marked onto the part (also known as direct part mark or DPM). Many 2D codes are marked onto the part using laser etching or dot peening creating a permanent DPM. Even challenging to read codes, due to poor marking, or marking on a curved surface, can be read reliably with advanced reading algorithms.



5. MULTIPLE CODE READING AND OUTPUT CAPABILITY

With so many types of image-based readers available today, it's important to note that they are not all equal. The best image-based readers use advanced algorithms that can locate and decode multiple barcodes of any type. These imagers also allow the user to configure the order of readout to make it easier to integrate the reader into the production process. In many applications, the order that encoded information is output from the reader is very important. For example, it may indicate which test tube the code is read from or which part on a pallet is in which location. Having the flexibility to read multiple codes in one image and read them out in a pre-determined order can make a difficult application simple to install.

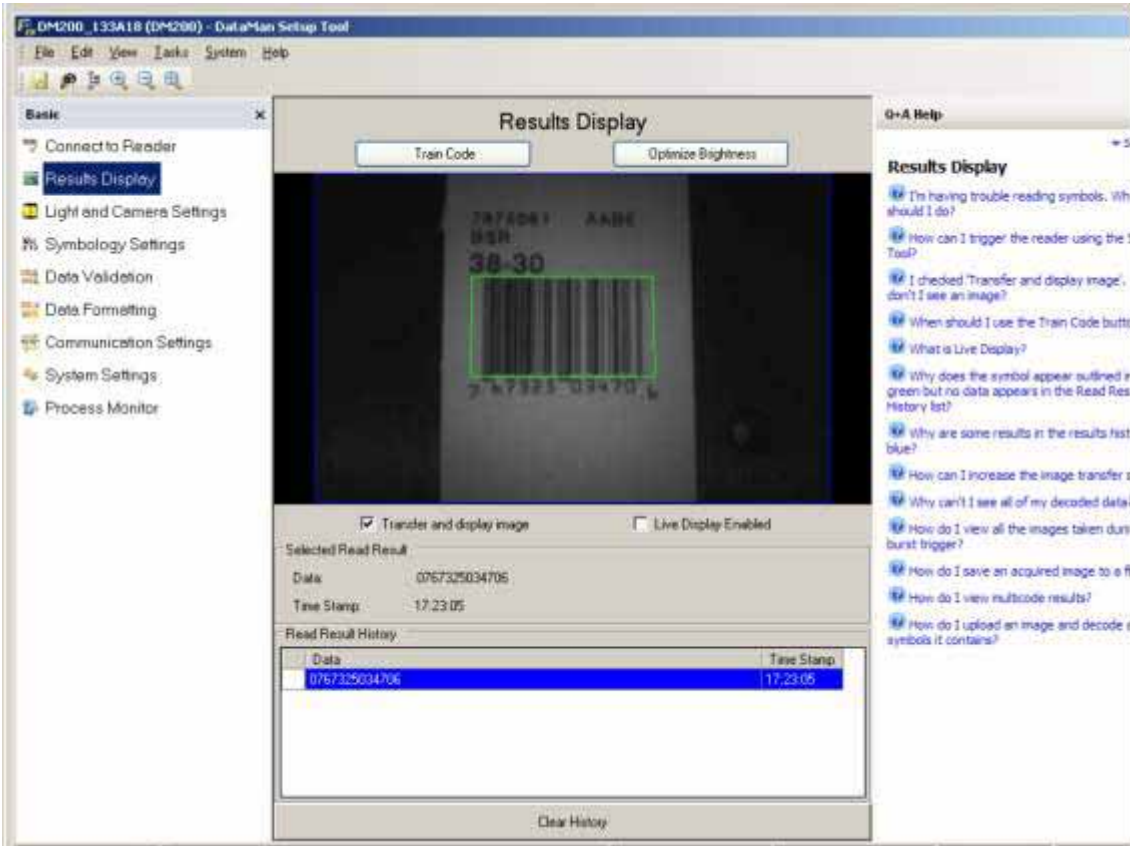


6. IMAGE ARCHIVING

With a laser scanner, there is no way to understand what happened if the scanner did not read the barcode. The most powerful image-based readers can be set up to archive images of successful or failed reads to provide a record of parts that have been successfully read on the production line, or to understand what caused a no-read. For example, the image can be used to see if the barcode was not present or was too severely degraded to decode. The automotive, aerospace and pharmaceutical industries, in particular, are using image archiving to provide detailed traceability of the manufacturing process.

7. EASE OF SETUP AND DEPLOYMENT

Image-based readers should offer simple step-by-step setup to configure the settings of the reader and to communicate the results. No special training should be required to set up and install an image-based reader. In addition, if the user is able to see the image while setting up the reader, it will be easier to ensure that the reader is properly focused and positioned to find and decode the code or codes in the field of view.



8. BARCODE QUALITY FEEDBACK

In many production lines, it is important to maintain the barcode print quality at a high level to ensure that the code can be read by other readers in the product distribution chain. Image-based readers can provide feedback on the quality of the print so the manufacturer can make adjustments before they ship badly printed codes to their customers.

9. VISUALIZATION AND COMMUNICATION

When the image-based reader is working on the production line, operators have options that allow them to monitor the read rate statistics and look at the images that the reader takes. This allows the operator to understand how the system is working and to quickly recognize what is happening if there is a



no-read. The image feedback at runtime lets the operator see what's happening while the system is online. The operator can also make simple adjustments to the reader through the online view without having to find a manual to understand how to make setup changes.

In addition, industrial protocols like Ethernet/IP and Profinet allow image based readers to be easily integrated into the factory network. Direct communication with PLCs allows both data communication and control to make the reader part of the quality control process.

10. FUTURE PROOF

While many industries are beginning to add 2D codes, such as Data Matrix or QR to provide additional tracking information to parts, not all industries are adopting these types of codes quickly. If this is the case, it's important to know that some image-based readers help make the transition from laser based to image-based scanning easier, with a lower cost model. These readers offer omnidirectional 1D barcode reading and lower risk with the ability to upgrade those 1D barcode reading models to enable 2D codes such as Data Matrix and QR codes. In addition, the most advanced image-based readers also have firmware update programs, ensuring that the reader's firmware can be upgraded with the latest decoding methods and new code types. The idea of future proofing the line allows the user to start transitioning from laser scanners to image-based readers at a lower cost, and allows the flexibility to upgrade in the future without having to replace the readers again and again.

FINAL THOUGHTS

If you are currently using laser based barcode readers, now is the time to investigate the advantages of image-based code readers. You may also find that image-based readers open up new opportunities for you to identify, track and trace products and components on your manufacturing lines and throughout the supply chain.

About Cognex® Corporation

Cognex Corporation designs, develops, manufactures and markets machine vision sensors and systems, or devices that can "see." Cognex vision sensors and systems are used in factories around the world where they guide, inspect, gauge, identify and assure the quality of a wide range of items during the manufacturing process. Cognex is the world's leader in the machine vision industry, having shipped more than 500,000 machine vision systems, representing over \$2.5 billion in cumulative revenue, since the company's founding in 1981. Headquartered in Natick, Massachusetts, USA, Cognex has regional offices and distributors located throughout North America, Japan, Europe, Asia and Latin America. For details, visit Cognex on-line at <http://www.cognex.com>.

Cognex is the world leader of image-based ID readers and is the only company that can support all of your 1D barcode and 2D code reading requirements. Cognex DataMan® readers are offered in either fixed-mount or handheld models (handheld models available wired or wireless) and offer patented code reading technology, with IDMax®, which includes:

1D Barcode Reading

Cognex DataMan ID readers provide the best overall read rates for 1D barcodes—handling extreme variations of code degradation with 1DMax™ technology. They can also read codes in any orientation and can read multiple codes simultaneously. With better read rates and no moving parts image-based ID readers are increasingly replacing laser scanners on the factory floor.

2D Code Reading

From easy to read 2D codes on labels to Direct Part Marks (DPM) on electronics components, plastic, ceramics or metal, to high density codes on glass—DataMan ID readers provide the most robust reading reliability for all industries with 2DMax™ patented reading algorithm and UltraLight® illumination technologies. These technologies have enabled direct marked 2D codes to be applied to a wide range of products that previously were difficult to identify and track through their manufacturing and usage lifecycle.

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

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