

Achieving Highest Read Rates

#1 Benchmark for Rating ID Reader Performance

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.

Why Do Read Rates Matter?

- Read rate is a measure of process reliability and robustness
- No-reads typically cost money, time and effort to remedy
- The higher the read rate, the higher the throughput

Image-based Identification

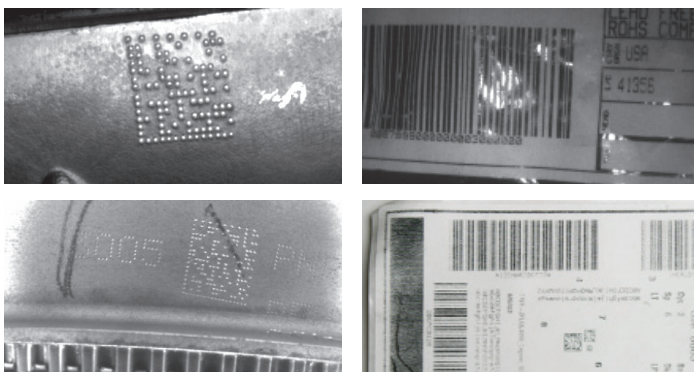
Thanks to advances in microprocessors, imaging sensors and decoding algorithms, image-based ID readers have become not only more affordable, but also more powerful than traditional laser scanners.

Image-based readers view the entire barcode, not just a single line, so they can overcome various barcode defects better than laser scanners. Image-based readers can also read barcodes in any orientation and can decode 2-D (two-dimensional) symbologies like Data Matrix and QR.

With these advantages, image-based readers achieve higher read rates than laser-based scanners.



Reading well-printed codes is easy for most image-based readers, while laser scanners can only read 1-D barcodes



Difficulties arise when codes are presented in more realistic situations

3 Steps to Read a Code with Image-Based ID Readers

- 1. Illuminate the code.** Light angle and direction, surface finish, shape and color all determine how the mark is seen by the reader. Applying the optimal lighting improves read rates and ease of use of the ID reader.
- 2. Locate the code.** If you can't find the code, you can't read it. Algorithms that can quickly identify codes presented at any angle, size or quality will have fewer no-reads, thus higher read rates. If the algorithm mistakenly finds a non-code and tries to read it, it has wasted valuable processing time.
- 3. Extract the data.** When the code is found within the field of view, the decoding algorithm must be able to extract the data, even when presented with damage, lighting or material variations.

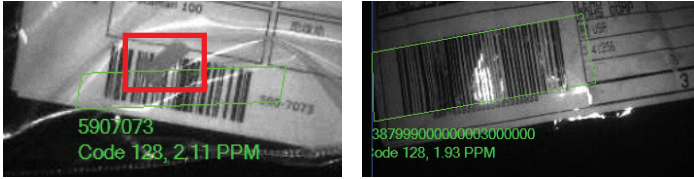
The most intelligent algorithms do not need multiple attempts with different images to achieve the highest read rates. The algorithm's finding and extracting steps should be designed to overcome limitations in illumination or poor marking that can occur over time.

Powerful Decoding Software Algorithms

Cognex DataMan® image-based ID readers are optimized with patented algorithms for continuously high read rates (99.9%) even for the most challenging DPM (Direct Part Mark) and high speed label-based identification applications. The algorithm is the intelligence of an ID reader — the true differentiator. Even when a camera-based system acquires a very good image, the codes can still be damaged, or be marked very badly. Cognex **1DMax+**™ and **2DMax+**™ algorithms are what give DataMan industrial ID readers the aptitude to find and decode damaged or poorly marked 1-D or 2-D codes through the widest range of illumination, marking and material variations.

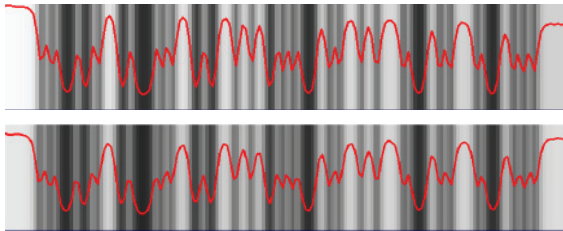
1-D linear barcode reading

Cognex invested many man-years into the development of an entirely new, best-in-class 1-D algorithm. In the most difficult-to-read situations, the **1DMax+** algorithm with Hotbars™ technology can essentially reconstruct barcodes using the good portions of the code that the imager can find. This means that it can locate and read very damaged codes, and codes with very low resolution.



1DMax+ finds and reads Code 128 barcodes through plastic, codes with specularly and codes that have obstructions

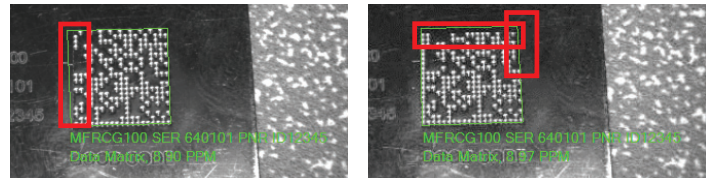
Patent-pending Hotbars technology is an entirely new way of reading the traditional 1-D linear barcode. With a solid mathematical foundation, Hotbars combines superior signal fidelity with lightning speed. This means that barcodes can be located within the field of view much more quickly than before, allowing the algorithm to then decode what is found.



Signal from Hotbars → Higher fidelity at 10x the speed

2-D matrix code reading

2DMax+, a breakthrough in 2-D decoding software based on patented, industry leading, Cognex pattern-matching technology, handles a wide range of degradations to the appearance of 2-D DPM or printed codes no matter what the cause or surface.



Data Matrix built-in error-correction can help in many cases but not when critical parts are missing. 2DMax+ can even decode Data Matrix codes missing finder patterns (left) or timing/clocking patterns (right)



2DMax+ easily finds and reads Data Matrix codes that are overexposed and underexposed without multiple retries, improving throughput, speed and overall reliability.

Read any code, every time

Cognex has the product versatility and most advanced technology to help you meet your identification goals whether your application uses 1-D linear barcodes or more complex 2-D matrix codes:



1-D High Speed

Fast moving 1-D barcodes printed on parts or packaging.



2-D Direct Part Mark

Dot peen, etched or laser marked 2-D Data Matrix codes marked directly on parts.



1-D Low Speed

Slow moving or stationary 1-D barcodes printed on parts or packaging.



2-D Printed

2-D printed codes on labels and packaging. Moving or stationary, these can include mix of 1-D and 2-D codes.

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Printed in the USA. Lit. No. DMTN-20120330-0