

## What is Bar Code Verification?

### QUALITY CONTROL FOR BAR CODES!

Verification measures the printed quality of the bar code to international (ISO) standards. This is the standard used by retailers worldwide. According to international standards, verification is mandatory for all companies either designing or printing their own bar codes, ensuring that an acceptable image is created.



Despite the complex nature of verification equipment it should be simple to use and display the results in clear, easy to interpret terms. The Verifier should be the bar code expert in your organization, removing the burden of knowledge from your staff. If the format of the bar code is incorrect, the size too large or too small or the print quality unacceptable, the symbol will fail to scan. The supply chain is broken. The number needs to be entered manually – perhaps incorrectly. A customer incorrectly charged. Wrong goods ordered or dispatched.

***In many cases a poorly printed barcode is worse than no bar code at all.***

### Why Verify?

Bar code quality is vital, as every time a bar code fails to scan, costs are incurred. At best the data is required to be input manually whilst at worst deliveries are rejected.

A recent survey by the e-centre (EAN UK) put the cost of poor quality bar codes at over £500 million. Until recently, many retailers have accepted these costs as a 'fact of trading life'. However, an ever increasing number of major retailers are now taking a very different approach by passing these costs back to suppliers. Goods are returned and fines imposed. For repeat offenders the ultimate sanction can be, and has been, delisting as a supplier.

#### Insurance

At its most basic level, verification is an insurance policy helping to assure you that your bar code will scan first time at all levels in the supply chain, thus enhancing your supplier/customer relationship.

But it's more than that. As part of an effective QA system it can help you win business. Are your competitors using verification? Are they questioning the quality of your bar codes with your customers? Is it affecting your business?

### Why Can't I Just Use A Scanner?

Scanning is no substitute for verification as no two bar code readers are identical. They vary from wands to lasers to cameras, from manually operated to automatic. Ambient light will vary as will the distance of scanning. A bar code that is 'checked' with a wand gives no guarantee that it will be readable with another wand, let alone a laser based unit.

A verifier is a scientific device, taking precise measurements of each individual bar and space and the amount of light reflected from each. More advanced units will automatically identify the symbology and magnification, check data structure and validate the content as well as providing diagnostic information. It is all very well knowing that your bar code is incorrect but a verifier must be able to identify the problem to allow you to take the necessary corrective action.

### Why was the ISO/CEN/ANSI method introduced?

Prior to the Current ISO standard of verifying printed bar code symbols, only two factors were taken into

consideration:

- Dimensional accuracy of the bars and spaces.
- Reflectance values of the bars and the background (PCS).

This traditional method would have been a reasonable way of assessing the print quality, except that there was no agreed way of determining where bar edges actually were or how and where reflectance measurements should be made. As well as this, bar codes were being measured with differing beams of light (apertures). Both of these factors resulted in a wide variation of results between verifiers.

With the variety of uses for bar codes and the wide range of printing techniques used, it was felt that a more scientific approach was needed. In particular it was noted that different scanners and the differing environments in which these were used resulted in some aspects of poor print quality being more significant than others. Simple reflectance measurements were also found not to be helpful when the contrast might vary within the symbol. A definition of where a bar-space transition actually occurred was required as were specific aperture sizes dependent upon the symbology and size of bar code.

These were then the main elements of the method that was initially written up as an ANSI standard. This was then adopted by CEN and eventually became an ISO standard. A Scan Reflectance Profile (an analogue graph of the reflectance values of a defined wavelength of light from a bar code symbol across a scan path) was to be analysed and specific measurements made from this profile in order to grade the scan. It was also specified that a single scan was not enough for an overall symbol grade to be decided and scans should therefore be taken at up to ten different heights within the symbol. The average of these results then becomes the overall symbol grade.

This method has proven to be a thoroughly scientific approach but one that is also accepted and generally understood by users of bar codes throughout the world. The grading method is also easy to understand and different grade requirements can be set for various applications of bar code technology without the method needing to change. In recent testing of verification equipment from various manufacturers, the method has also proved to solve the main problem with the traditional approach, as it was found that different pieces of equipment gave the same results when applied to reference symbols.

### What is checked/ what is not checked?

Checked	
<ul style="list-style-type: none"><li>• Reflectance</li><li>• Contrast</li><li>• Decode</li><li>• Light margins</li></ul>	<ul style="list-style-type: none"><li>• Bar gain</li><li>• Defects</li><li>• Check Digits</li></ul>
Not Checked	
<ul style="list-style-type: none"><li>• Human readables</li><li>• Location</li><li>• Height</li></ul>	<ul style="list-style-type: none"><li>• Truncation</li><li>• Orientation</li></ul>
Advanced Checks	
<ul style="list-style-type: none"><li>• Magnification (X Dimension)</li><li>• Wide to Narrow Bar Ratio</li><li>• Application standards (Coupons, variable weight, etc...)</li></ul>	<ul style="list-style-type: none"><li>• UCC.EAN-128 data validity</li><li>• RSS Data validity</li><li>• Full encodation</li><li>• Integral check digit</li><li>• Data format</li></ul>

### Case study: What are the common problems with on-demand printers ?

As the number of people printing outer case bar codes on-demand has increased, so has the number of product rejections. The vast majority of these are a small number of basic print quality issues on thermal printers that should be identified prior to dispatch and which should never have been allowed to enter the supply chain.

- Voids in barcodes
- Labels printed in 'ladder format': White lines running parallel to the length of the bar code. Some retailers are now operating a zero tolerance approach to such bar codes . See Below.



- Labels printed in 'picket fence format: White lines running through the height of the bar code. Massive problem that can mean that part of the bar (or even a whole bar) is missing. Leading to failure for the ISO grades defects, decodeability and decode. See Below.



- Bar gain. Incorrect speed and/or temperature settings. Result: Bars too wide, spaces too small. Generally causing the bar code to fail for decodeability.
- Light margin infringements: Bar code too big for the label; incorrect positioning on label; text too close to the bar code. Result: An automatic grade F for decode.

## MANAGING QUALITY

Barcode quality is perhaps more important now than ever before. The use of automated systems in warehouses and distribution centers is becoming more widespread. For these systems to work effectively, the format, data content and the print quality must all be accurate. The more sophisticated forms of bar codes such as UCC/EAN-128 demand an extra level of quality management.

The only way to guarantee both the print quality and the data content of your bar code is by using the correct equipment. An ISO grade bar code Verifier will check that the printing of your bar codes is of an acceptable quality. Some will also be able to give you details of the UCC/EAN-128 data content as well as matching the bar code number to a product; ensuring that your packaging will not be a problem to your trading partners. This cannot be done by eye or with a standard bar code scanner.

By incorporating verification into your quality assurance systems you can ensure that your bar codes read first time, every time.