



IMPLEMENTATION GUIDE

Length of the Product Code Bar Code and Concatenation

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1 Introduction

1.1 Purpose

The purpose of this document is to provide additional guidance recommending optimal bar code length and placement of Product Code [Data Structure 003] for concatenation.

1.2 Scope

This document is a supplement to the ISBT 128 Standard Technical Specification. It provides specific guidance for bar code placement to allow for concatenation. This document also addresses concerns for printer setup of the Auto 128 feature.

1.3 Intended Audience

The intended audience of this document is blood transfusion facility staff (management, information technology, quality, validation, and laboratory), cellular therapy facility staff (collection, processing, and transfusion centers), tissues staff (procurement, processing, and transplant centers), and software developers, and label/software vendors.

1.4 Normative References

ISBT 128 Standard Technical Specification (ST-001)

1.5 Other References

ICCBBA Website (www.iccbba.org)

Technical Bulletin 5: Bar Code Scanner Implementation of ISBT 128 Concatenation (IG-008)

1.6 Background

A specification for the use of ISBT 128 for the labeling of blood products was developed by the International Society of Blood Transfusion Working Party on Automation and Data Processing (WPADP) [now called the Working Party on Information Technology] and published by ICCBBA in 1995. Countries around the world are in various stages of implementation, and the model originally developed by the WPADP has demonstrated its suitability by accommodating regional changes without substantial structural change.

International standardization of labeling is a key element of ISBT 128. Standardized bar codes allow medical products of human origin to be shipped internationally with clear, unambiguous labeling and can be used to overcome language barriers.

This document includes information related to barcode placement, optimal bar code length, and placement of Product Code [Data Structure 003] for concatenation.

2 ISBT 128 Concatenation, “Auto 128,” and Printing of Product Code and Expiration Date Bar Code Symbols

2.1 Auto 128

There is a feature built in to most thermal transfer printers, usually called “Auto 128,” that automatically determines which Code 128 subset will result in the shortest bar code message and prints the symbols accordingly.

For example, when product code E3180V00 is printed, subset B is used exclusively because switching to subset C for the string of four numerics (3180), then back to subset B for the alpha character (V), then back to subset C for the remaining two numerics (00) does not conserve sufficient space. However, if the product code is E3180100, switching to subset C following the initial alpha character (E) will reduce the overall symbol length by about 0.22”.

Most printer manufacturers have the “Auto 128” feature. Fortunately, nearly all of these manufacturers allow the feature to be disabled. If it is disabled, the printer will generate Code 128 symbols exactly as directed by the software driving it. It is important to be aware of this issue should you be using a printer that does not allow the feature to be disabled.

That same software also dictates the placement of each graphic element on the label. Because of the 0.22” difference in message length mentioned above, the shorter symbol would be nearly one-fourth of an inch further away from the symbol with which it is intended to be concatenated. This is because most software dictates graphic placement via the upper- or lower-left corner of the symbol.

2.2 Concatenation

The current ISBT 128 Technical Specification and the now retired ISBT 128 Application Specification outline two preferred means of implementing concatenation, each of which dictates the maximum physical distance between the two symbols to be concatenated.

2.2.1 Method 1

The ISBT 128 Application Specification from ICCBBA previously read: “Corresponding points of the last bar on the Code 128 stop codes on the two validly decoded concatenable bar codes must appear to be physically within a specific maximum distance of each other.”

If “Auto128” is enabled within the printer, what will happen when a shorter symbol is printed and scanning is attempted using Method 1?

Expressed in terms of Z_1 , the symbol lengths are as follows:

| | |
|---------------------------------|-----------|
| Product code without “Auto 128” | 145 Z_1 |
| Product code with “Auto 128” | 123 Z_1 |

| | |
|--------------------------|--------------------|
| Expiration date and time | 123 Z ₁ |
| Expiration date | 101 Z ₁ |

Assuming a fixed location for the left edge of each symbol, the following gaps between symbols and concatenation distances could result from the possible combinations of the various symbol lengths.

| Product Code | Expiration Date | Gap | Concatenation Distance |
|--------------|-----------------|-----|------------------------|
| 145 | 123 | 51 | 174 |
| 123 | 123 | 73 | 196 |
| 145 | 101 | 51 | 151 |
| 123 | 101 | 73 | 174 |

The ISBT 128 Application Specification dictated a maximum distance between the last stop bars (concatenation distance) of 210 Z₁ (with Julian day, hour, and minute) and 185 Z₁ (with Julian day only), or 2.1" and 1.85", respectively. Based on these maximums, the shorter product code symbol should not prohibit concatenation.

2.2.2 Method 2

The current ISBT 128 Technical Specification specifies that the temporal and spatial constraints for concatenation are:

- the gap between last bar of the left bar code and the first bar of the right bar code shall be $36X \pm 16X$ (That is equivalent to 9 ± 4 mm when the X dimension is 0.25 mm)
- both bar codes shall be oriented in the same manner (the Standard allows flexibility to accommodate slight misalignment, but labels should be affixed so that the bars in the bar codes are as close to parallel as possible)
- vertical alignment shall allow a single straight line scan to pass completely through both bar codes
- no vertical lines may appear between pairs of bar codes that are meant to be concatenated
- the stop codes shall be on the same side of both bar codes

In addition to these requirements, the X dimensions of both bar codes should be the same.

Using method 2, shorter bar code symbols may exceed the limit for the gap between the last bar of the left bar code and the first bar of the right bar code.

2.2.3 Conclusion

To provide for scanners using Method 2 concatenation, software developers must be aware of the printer(s) being used and of the "Auto 128" feature and so that if shorter symbols are printed they are placed in a position that does not compromise possible concatenation. In addition, associated eye-readable text should be placed on the label to comply with the current ISBT 128

Technical Specification to preserve a consistent label appearance, regardless of symbol length.

There is at least one software technique that will resolve this issue. If the bar code symbol is rotated 180 degrees, the “anchor” point is established and rotates with the symbol. Of course, scanning the symbol in a left-to-right direction means the stop code will typically be encountered and decoded first, but this should not present a problem to the reader, which will read the symbol in its entirety prior to transmission. It does not present a concatenation problem either, since the scanner “sees” the symbol as being properly placed and performs the concatenation as requested.