



The GS1 System uses the following bar code symbologies as the data carriers:

- The EAN/UPC Symbology is exclusively reserved for encoding Global Trade Item Numbers (GTINs). EAN/UPC Bar Codes must be used for all trade items which are scanned at the Point-of-Sale (POS) in retail outlets and may be used on other non-retail trade items. EAN-8 and UPC-E Bar Codes are only used on very small retail trade items to encode the GTIN-8.
- The ITF-14 Symbol is exclusively used for encoding GTINs printed on non-retail trade items not passing through the retail POS. The ITF-14 Bar Code is better suited for direct printing on to corrugated fibreboard.
- The GS1-128 Symbol is a precise subset of the 'Code 128' Symbology. Its use is exclusively licensed by GS1. This extremely flexible symbol is used for the encoding of GS1 Identification Keys as well as encoding attribute information using Application Identifiers.

Unit type	EAN-8 UPC-E	EAN-13 UPC-A	GS1-128	ITF-14
Retail trade item	✓	✓		
Non-retail trade item		✓	✓	✓
Logistic Unit			✓	
Location			✓	
Asset			✓	
Document or Service Relationship			✓	

TABLE 1. Bar Code Options

- The GS1 DataBar Symbology is a family of bar codes which can be printed as stand-alone symbols or with an accompanying 2D Composite Component printed directly above the the GS1 DataBar linear component. GS1 DataBar has been approved for bilateral use between trading partners from 2010. In 2014 GS1 DataBar becomes an open symbology and all scanning environments must be able to read these symbols. To date, symbol specifications have been developed for retail Point-of-Sale only.
- The GS1 DataMatrix Symbol is stand-alone two-dimensional matrix symbology that is made up of square modules arranged within a finder pattern. For more information refer to chapter 7 GS1 DataMatrix Symbology on page 54.



1.1 Symbology Operational Bands

Consideration for selecting the correct bar code specification is based on where the symbol will actually be scanned, or the bar code operative scanning environment. The six operative scanning environments for GS1 Bar Codes are;

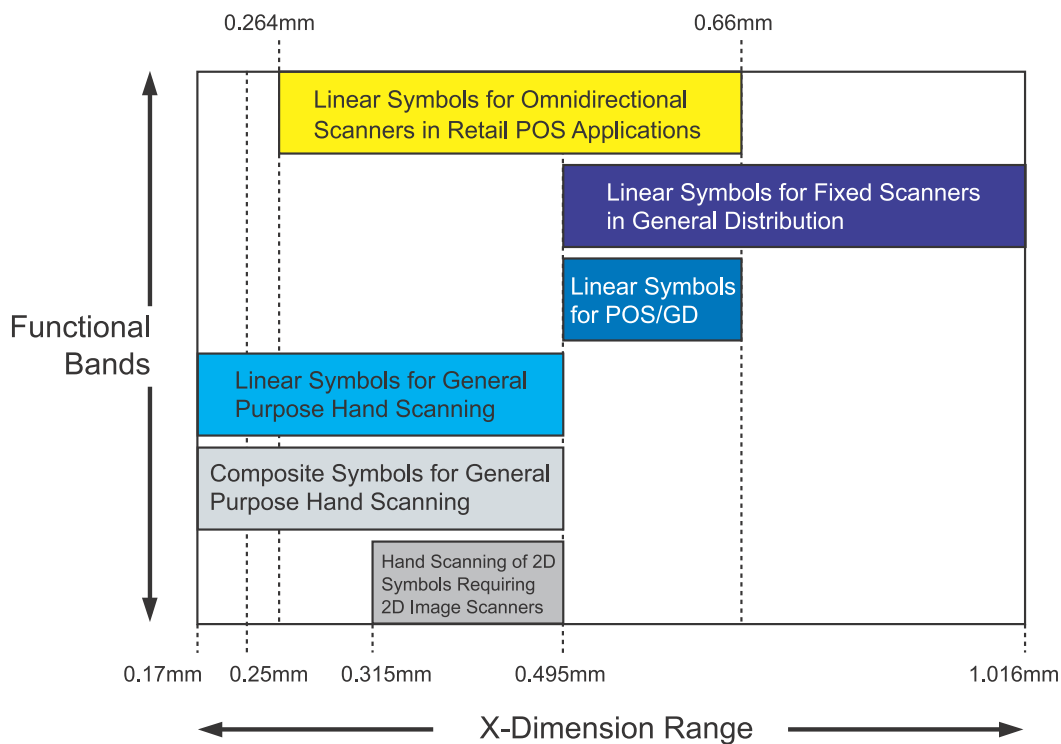


Figure 1 - Symbology Operational Bands

Omnidirectional Scanners in Retail POS Applications

This band is primarily intended for retail operations to provide orientation-free scanning. Scanners are designed to read EAN/UPC over-square bar codes. The approximate average distance between scanner and bar code is 100mm.

Fixed Scanners in General Distribution

The fixed scanners in General Distribution band is primarily intended to facilitate automated scanning of trade items packaged for transport and logistic units using fixed mount scanners. In this environment it is essential to maintain symbol height and location to achieve acceptable scan rates.



Both Retail POS and General Distribution

Linear bar codes for both Retail and General Distribution band covers trade items in specific packaging suitable for transport purposes in General Distribution Scanning but that are also scanned at the retail POS.

General Purpose Hand Scanning

This scanner band covers a broad range of applications. Bar code size must be within the maximum and minimum boundaries for the symbology, but the target size is directly related to the exact usage as specified by the application guidelines. It has been divided into three bands. One for linear general purpose hand scanning and two bands for two-dimensional bar codes, Composite component and Data Matrix. In general, the rule is that Composite Components shall be printed at the same density as their linear host. Data Matrix Symbols shall be printed at densities that are 50 percent greater than corresponding linear symbols with Composite Components. Therefore, the bands for linear symbols and Composite Components are very similar in density and if the same scanner types are chosen, as in the case of Composite Symbols, the bands become one.



1.2 Symbology Identifiers

All scanning equipment has the ability to recognise the symbology of the bar code that has been scanned. Some scanners have the optional feature of being able to transmit a **Symbology Identifier**. The Symbology Identifier is a three character data string comprising a flag character, code character and a modifier character.

Character	Description
]	The flag character (which has an ASCII value of 93) denotes that the two characters following are symbol identifier characters.
c	The code character denotes the type of symbology.
m	The modifier character denotes the mode in which the symbology is used.

TABLE 2. Symbology identifier definitions

Note: If used the symbology identifier is transmitted as a prefix to the data message.

The symbology identifiers used in the GS1 System are as follows:

Symbology identifier*	Symbology format	Content
] E 0	EAN-13, UPC-A or UPC-E	13 digits
] E 1	Two-digit EAN/UPC Add-on	2 digits
] E 2	Five-digit EAN/UPC Add-on	5 digits
] E 3	EAN-13, UPC-A or UPC-E with Add-on**	15 or 18 digits
] E 4	EAN-8	8 digits
] I 1	ITF-14	14 digits
] C 1	GS1-128	Standard AI Element Strings
] e 0	GS1 DataBar***	Standard AI Element Strings
] d 2	GS1 DataMatrix	Standard AI Element Strings

* Symbology identifiers are case sensitive.

** EAN/UPC Bar Codes with Add-Ons may be considered either as two separate bar codes, each of which is transmitted separately with its own symbology identifier, or as a single data packet. The system designer shall select one of these methods.

*** The same symbology identifier is used for all versions of GS1 DataBar

TABLE 3. Symbology Identifiers



1.3 Disclaimer

Every possible effort has been made to ensure that the information and specifications in this manual are correct, however GS1 Australia expressly disclaim liability for any errors. In addition, no warranty or representation is made that this manual will not require modification due to developments in technology or changes or additions to the GS1 System.

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