



GSMP:
General Specifications Change Notification (GSCN)

Table with 3 columns: WR #, GSCN Name, Effective Date. Row 1: 17-000190, Global Service Relation Number (GSRN) in GS1 DataBar for Point Of Sale use, 20-Sep-2017

1 Associated Work Request (WR) Number:

17-000190

2 Background:

Migros (major Swiss retailer) is targeting to use the GSRN for loyalty cards that are scanned at POS. GS1's standards currently do not allow for GSRN to be carried by a symbology that may be used at POS. Therefore, this request is to expand the GS1 data carriers that may carry the GSRN to include GS1 DataBar Expanded and GS1 DataBar Expanded Stacked. This change will open the door to further uses of the GS1 DataBar and may spread to other retailers, resulting in broader implementation. Migros supports this work request and will participate in the ID SMG to see to its completion. The GS1 MO AIDC Technical Interest Group has been consulted and there is a common consent to support this WR.

3 2.5 Service relationships

4 Application description

The Global Service Relation Number (GSRN) is a non-significant number used to identify the relationship between an organisation offering services and the individual entities providing or benefitting from the services. The GSRN provides unique and unambiguous identification. It is the key to accessing information, stored on computer systems, relevant to service(s) provided and received and in some cases, these services could be recurring. The GSRN may also be used for referencing information transferred via Electronic Data Interchange (EDI).

When using the GSRN, often two types of relationships may need to be captured in one transaction:

- 1. The relationship between the organisation offering the service and the actual recipient of the service.
2. The relationship between the organisation offering the service and the actual provider of the service.

It should be noted that the GSRN is not meant to identify a single service as a trade item, neither is it used to identify a physical unit as a trade item. It may identify a physical unit for service purposes (e.g., a computer with a service agreement).

19 2.5.1 Global Service Relation Number – Provider: AI (8017)

20 An element string with GS1 Application Identifier AI (8017) represents the Global Service Relation
21 Number of a relationship between the organisation offering the service and the provider of the service.
22 Some examples of how the GSRN can be used to identify the service relationships are:

- 23 A medical procedure, where it could be used to identify an individual medical provider by role. For
24 identification of the individual provider of care, the hospital or the appropriate authority generates
25 a GSRN with AI (8017) for each of its caregivers and encodes it in an appropriate GS1 Data carrier
26 (barcode) symbol on the caregiver's ID card, work station, work order, etc. In this case, the GSRN
27 would ensure non-significant identification management, securing identification uniqueness and
28 also allowing linkage to local rule management systems.
29 A service agreement, where it could be used to manage agreed upon services, such as
30 maintenance services for a television or computer.

- 31 ■ A loyalty program required to identify the service relationship between the loyalty program and  
32 the service provider (i.e. company providing merchandise due to use of loyalty points).
- 33 ■ A hospital administration can identify the service relationship between hospital and the doctor,  
34 nurses, etc.

## 35 **GS1 key**

### 36 **Definition**

37 The Global Service Relation Number is the GS1 identification key used to identify the relationship  
38 between an organisation offering services and the recipient or provider of services. The key is  
39 comprised of a GS1 Company Prefix, service reference and check digit.

40 See section 3.2, *Global Service Relation Number AI (8017) and AI (8018)* for the definition of the GS1  
41 Application Identifier.

### 42 **Rules**

43 See section 4, GSRN allocation rules.

### 44 **Attributes**

#### 45 **Required**

46 Not applicable

#### 47 **Optional**

48 GS1 Application Identifier AI (8019) Service Relation Instance Number, section 3.2

### 49 **Rules**

50 Not applicable

### 51 **Data carrier specification**

#### 52 **Carrier choices**

53 The data carriers for the Global Service Relation Number (GSRN) are the [GS1 DataBar Expanded](#), [GS1](#)  
54 [DataBar Expanded Stacked](#), GS1-128, GS1 DataMatrix and GS1 QR Code symbologies.

#### 55 **Symbol X-dimension, minimum symbol height, and minimum symbol quality**

56 See section 5.5.2.7.11, GS1 system symbol specification table 11

#### 57 **Symbol placement**

58 No standard placement is required.

### 59 **Unique application processing requirements**

60 For a description of processing requirements, see section 7.

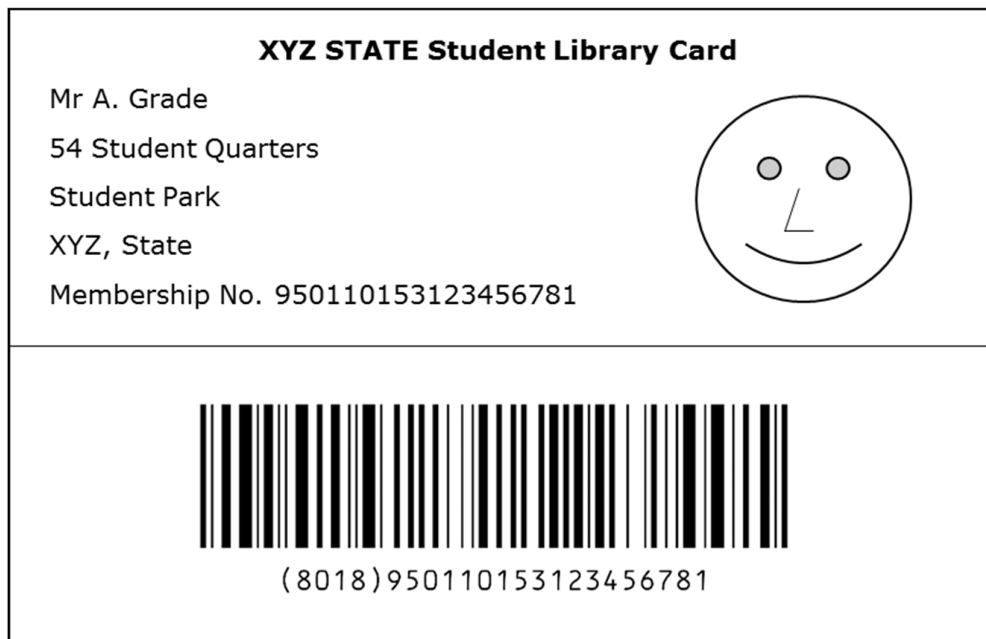
## 61 **2.5.2 Global Service Relation Number – Recipient: AI (8018)**

62 An element string with GS1 Application Identifier AI (8018) represents the Global Service Relation  
63 Number of a relationship between the organisation offering the service and the recipient of the  
64 service. Some examples of how the GSRN can be used to identify the service relationships are:

- 65 ■ A hospital admission, where it could be used to identify a subject of care globally and uniquely for  
66 AIDC purposes and establish an identification uniqueness that does not harm privacy. For  
67 identification of the subject of care (patient) the hospital generates a GSRN with AI (8018) for  
68 each of its patients and encodes it in an appropriate GS1 Data carrier (barcode) on the patient's  
69 wristband as well as his or her corresponding medical record, pathology samples, etc. The GSRN  
70 may then be used as the key to link multiple or specific instances of treatment, room charges,  
71 medical tests, and patient charges.
- 72 ■ A membership in a frequent flyer programme, where it could be used to record awards, claims,  
73 and preferences.
- 74 ■ A membership in a loyalty scheme, where it could be used to record visits, purchase value, and  
75 awards.

- 76 ■ A membership in a club, where it could be used for recording entitlements, use of facilities, and  
77 subscriptions.
- 78 ■ A loyalty program required to identify the service relationship between the loyalty program and  
79 the recipient of the loyalty program (the end user or customer who earns loyalty points).
- 80 ■ Patient admission to a hospital can identify the service relationship between the hospital and the  
81 patient.
- 82 ■ Utility networks, such as those providing electricity, gas or water, where it could be used to  
83 identify the relationship between network service providers and suppliers of utility products.
- 84 ■ A GSRN could be used to give students access to other libraries that have formed a cooperative  
85 lending agreement. A typical application is the identification of membership in a student library.  
86 The library would issue all members a card that includes a unique GSRN identifying the  
87 relationship between the library and a student. The library would then scan the GSRN whenever a  
88 book was lent or returned. The Electronic Message from the scanner would then be used to  
89 automatically update the library's stock management database. See the figure below for an  
90 example of how the service relationship identifier would appear on this membership card.

91 **Figure 2.5.2-1.** Example of GSRN on a membership card



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93 **GS1 key**

94 **Definition**

95 The Global Service Relation Number is the GS1 identification key used to identify the relationship  
96 between an organisation offering services and the recipient or provider of services. The key is  
97 comprised of a GS1 Company Prefix, service reference and check digit.

98 See section 3.2, *Global Service Relation Number AI (8017) and AI (8018)* for the definition of the GS1  
99 Application Identifier.

100 **Rules**

101 See section 4, GSRN allocation rules.

102 **Attributes**

103 **Required**

104 Not applicable

105 **Optional**

106 GS1 Application Identifier AI (8019) Service Relation Instance Number, section 3.2.

107 **Rules**

108 Not applicable

109 **Data carrier specification**

110 **Carrier choices**

111 The data carriers for the Global Service Relation Number (GSRN) are the [GS1 DataBar Expanded](#), [GS1](#)  
112 [DataBar Expanded Stacked](#), GS1-128, GS1 DataMatrix and GS1 QR Code symbologies.

113 **Symbol X-dimension, minimum symbol height, and minimum symbol quality**

114 See section 5.5.2.7.11, GS1 system symbol specification table 11

115 **Symbol placement**

116 No standard placement is required.

117 **Unique application processing requirements**

118 For a description of processing requirements, see section 7.

119 **2.5.3 Service Relation Instance Number: AI (8019)**

120 When a product or service is administered (e.g., a particular treatment is given) it can easily be  
121 associated with the patient by scanning the Global Trade Item Number (GTIN) of the product or  
122 service as well as the caregiver's GSRN (barcoded with AI (8017)) and the patient's GSRN (barcoded  
123 with AI (8018)). If the subject of care identification needs to, optionally, be made more granular with  
124 a sequence indicator corresponding to each encounter during the episode of care, attribute data in the  
125 form of a Service Relation Instance Number (GS1 Application Identifier AI (8019), see section 3.2)  
126 may be added. This would, for example, allow differentiation of subject of care identification captured  
127 from an identification band, both before and after its replacement (i.e. radiology examination). If the  
128 treatment plan requires different instances of care, such as chemotherapies, and when a record  
129 should be captured for each instance, the SRIN linked to the GSRN may be used.

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131 **2.7 Summary of applications and operative scanning environments for GS1 system symbols**

132 The figure below provides a cross-reference for all system applications defined in section 2 and the  
 133 GS1 symbol specification tables (SSTs) in section 5. The application where the barcode will be used  
 134 SHALL be determined prior to locating the correct symbol specification table (SST) entry. Use the  
 135 "SST(s)" column to find the SST appropriate for the application area. Because most application areas  
 136 provide a reference to two symbol specification tables based on the operative scanning environment, a  
 137 decision must be made between the two. See the decision tree figure 5.5.2.6.1 - 2 to determine the  
 138 correct symbol specification table.

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140 **Figure 2.7-1. Areas of GS1 system application**

Application	See section	SST(s)	Carrier choices
Fixed measure trade items – general retail consumer trade items scanned in general retail at POS:	<a href="#">2.1.2.1</a>		
▪ GTIN-12 and GTIN-13	<a href="#">2.1.2.1.2</a>	1	UPC-A, EAN-13, GS1 DataBar Retail POS family
▪ GTIN-12 carried by a UPC-E barcode	<a href="#">2.1.2.1.3</a>	1	UPC-E
▪ GTIN-8 carried by an EAN-8 barcode	<a href="#">2.1.2.1.4</a>	1	EAN-8, GS1 DataBar Retail POS family
▪ Hardcover books and paperbacks: ISBN, GTIN-13, and GTIN-12	<a href="#">2.1.2.1.5</a>	1	EAN-13, UPC-A, UPC-E. Options: EAN/UPC 2-digit or 5-digit add-on symbols
▪ Serial publications: ISSN, GTIN-13, and GTIN-12	<a href="#">2.1.2.1.6</a>	1	EAN-13, UPC-A, UPC-E. Options: EAN/UPC 2-digit or 5-digit add-on symbols
Fixed measure trade item - fresh food trade items scanned at POS	<a href="#">2.1.2.2</a>	1	GS1 DataBar Omnidirectional, GS1 DataBar Stacked Omnidirectional, UPC-A, EAN-13, EAN-8
Trade Items intended for general distribution and POS	<a href="#">2.1.2.3</a>	3	EAN/UPC, GS1 DataBar Retail POS family
Healthcare primary packaging (non-retail trade items)	<a href="#">2.1.2.4</a>	6	GS1-128, GS1 DataMatrix, GS1 DataBar, EAN/UPC, ITF-14, Composite Component
Healthcare secondary packaging (regulated healthcare retail consumer trade items)	<a href="#">2.1.2.5</a>	8 or 10	GS1-128, GS1 DataMatrix, GS1 DataBar, EAN/UPC, ITF-14, Composite Component
Trade items intended for general distribution scanning only	<a href="#">2.1.2.6</a>	2	EAN/UPC, ITF-14, GS1-128, GS1 DataBar
▪ Trade items intended for general distribution scanning only – regulated healthcare trade items	<a href="#">2.1.2.6</a>	8	GS1-128, GS1 DataBar, GS1 DataMatrix, EAN/UPC, ITF-14
▪ Trade items intended for distribution scanning in manufacturing, maintenance, repair and overhaul processes.	<a href="#">2.1.2.6</a>	4	GS1-128, GS1 DataMatrix, GS1 QR Code
Medical devices (non-retail trade items)	<a href="#">2.1.2.7</a>	7	GS1 DataMatrix
Fixed measure trade items packed in several individual pieces not scanned at POS	<a href="#">2.1.3</a>	2, 4	GS1-128, GS1 DataMatrix, GS1 QR Code
▪ Fixed measure trade items packed in several individual pieces not scanned at POS – Healthcare	<a href="#">2.1.3</a>	8 or 10	GS1-128
Direct marking	<a href="#">2.1.4</a>	4, 7	GS1 DataMatrix, GS1 QR Code
Variable measure trade items – Packages/containers not scanned in general retail at POS	<a href="#">2.1.5</a>	2	GS1-128, GS1 DataBar Expanded, GS1 DataBar Expanded Stacked, ITF-14
Fixed measure trade items – Restricted distribution	<a href="#">2.1.6</a>		
▪ Company internal numbering – RCN-8 Prefix 0 or 2	<a href="#">2.1.6.1</a>	1	EAN-8




Application	See section	SST(s)	Carrier choices
<ul style="list-style-type: none"> <li>Company internal numbering – RCN- 13 GS1 Prefix 04 (RCN-12 U.P.C. Prefix 4)</li> </ul>	<a href="#">2.1.6.2</a>	1	EAN-13, UPC-A
<ul style="list-style-type: none"> <li>Company internal numbering – RCN- 12 U.P.C. Prefix 0 (LAC and RZSC)</li> </ul>	<a href="#">2.1.6.3</a>	1	UPC-E
<ul style="list-style-type: none"> <li>GS1 Prefixes 02, 20 to 29 - Restricted Circulation</li> </ul>	<a href="#">2.1.6.4</a>	1	EAN-13 symbols
Variable measure fresh food trade items scanned at point-of-sale using GTIN	<a href="#">2.1.7.1</a>	1	GS1 DataBar Expanded, GS1 DataBar Expanded Stacked
Variable measure trade items scanned at point-of-sale using Restricted Circulation Numbers	<a href="#">2.1.7.2</a>	1	EAN-13, UPC-A
Trade Item extended packaging (general retail trade items)	<a href="#">2.1.8</a>	1 Addendum for AI (8200)	GS1 DataMatrix, GS1 QR Code
<ul style="list-style-type: none"> <li>Trade item extended packaging (regulated healthcare trade items)</li> </ul>	<a href="#">2.1.8</a>	6, 7, 8, or 10	GS1 DataMatrix only
Logistics units - individual logistic units	<a href="#">2.2.1</a>	5	GS1-128
Logistics units - multiple logistic units (GSIN, GINC)	<a href="#">2.2.2, 2.2.3</a>	2	GS1-128
Assets – Global Returnable Asset Identifier (GRAI)	<a href="#">2.3.1</a>	9	GS1-128, GS1 DataMatrix, GS1 QR Code
<ul style="list-style-type: none"> <li>Direct part marking of GRAI</li> </ul>	<a href="#">2.3.1</a> <a href="#">2.4.1</a>	7	GS1 DataMatrix, GS1 QR Code
Assets – Global Individual Asset Identifier (GIAI)	<a href="#">2.3.2</a>	9	GS1-128, GS1 DataMatrix, GS1 QR Code
<ul style="list-style-type: none"> <li>Direct part marking of GIAI</li> </ul>	<a href="#">2.3.2</a> <a href="#">2.1.4</a>	7	GS1 DataMatrix, GS1 QR Code
Locations and parties - Identification of a physical location	<a href="#">2.4.3.1</a>	9	GS1-128, GS1 Data Matrix, GS1 QR Code, EPC/RFID
Service relationships	<a href="#">2.5</a>	11	<a href="#">GS1 DataBar Expanded, GS1 DataBar Expanded Stacked</a> , GS1-128, GS1 DataMatrix, GS1 QR Code
Coupons identified using the Global Coupon Number	<a href="#">2.6.2</a>	1	GS1 DataBar Expanded, GS1 DataBar Expanded Stacked
Coupon identification for restricted geographic distribution (GS1 Prefix 99)	<a href="#">2.6.3.3</a>	1	EAN-13
GS1 common currency coupon identification (GS1 Prefixes 981 to 983)	<a href="#">2.6.3.4</a> <a href="#">2.6.3.5</a>		
Coupon code identification for use in North America (AI 8110, 8112)	<a href="#">2.6.3.6</a> <a href="#">2.6.3.7</a>	(*)	GS1 DataBar Expanded, GS1 DataBar Expanded Stacked or digitally transmitted
Refund receipts	<a href="#">2.6.4</a>	1	EAN-13
Electronic serial identifier for cellular mobile telephones (CMTI): AI(8002)	<a href="#">2.6.5</a>	4	GS1-128
Payment slips	<a href="#">2.6.6</a>	4	GS1-128
Customer specific articles	<a href="#">2.6.7</a>	1	EAN-13, UPC-A, ITF-14, GS1-128
Custom trade item	<a href="#">2.6.8</a>	4	GS1-128, GS1 DataBar, GS1 DataMatrix, GS1 QR Code
Global Document Type Identifier for document control	<a href="#">2.6.9</a>	9	GS1-128, GS1 DataMatrix, GS1 QR Code
Internal applications	<a href="#">2.6.10</a>	N/A	GS1-128, GS1 DataBar Expanded, GS1 DataMatrix, GS1 QR Code
Consumer trade item production control	<a href="#">2.6.11</a>	N/A	GS1 DataBar, GS1 DataMatrix, GS1 QR Code, GS1-128, Composite Component
Component / part identification	<a href="#">2.6.12</a>	N/A	GS1-128, GS1 DataMatrix, GS1 QR Code



Application	See section	SST(s)	Carrier choices
(*) See <i>US Coupon Application Guideline Using GS1 DataBar Expanded Symbols</i> for the appropriate SST.			

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 **Note:** GS1 DataBar has the capacity to carry GTIN-14, GTIN-14 is not intended for use at point-of-sale (POS) applications; therefore GS1 DataBar symbols for POS must not encode GTIN-14.

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### 5.5.2.7 GS1 system symbol specification tables

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In order to find the correct barcode specification, you must:

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- Find the appropriate GS1 system application area using figure 5.5.2.6.1-1.

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- If the application area references two symbol specification tables, use the decision tree in figure 5.5.2.6.1-2 to determine which one to use.

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The figure below provides a quick reference list of the symbol quality parameters depending on their type and their application.

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**Figure Error! No text of specified style in document.-1.** Quick reference on symbol quality

Symbology	Application or ID key	ISO (ANSI) symbol grade	Aperture	Wavelength
EAN/UPC	GTIN-8	1.5 (C)	See symbol specification tables 1, 2, 3, 4, 6, 8 and 10 for values	660 nm +/-10
EAN/UPC	GTIN-12	1.5 (C)	See symbol specification tables 1, 2, 3, 4, 6, 8 and 10 for values	660 nm +/-10
EAN/UPC	GTIN-13	1.5 (C)	See symbol specification tables 1, 2, 3, 4, 6, 8 and 10 for values	660 nm +/-10
GS1-128	GTIN-12, GTIN-13, GTIN-14	1.5 (C)	See symbol specification tables 2, 4, 5, 6, 8, 9 and 10 for values	660 nm +/-10
GS1-128	SSCC	1.5 (C)	10 mils	660 nm +/-10
ITF-14 (<0.635 mm (0.025 in.) X)	GTIN-12, GTIN-13, GTIN-14	1.5 (C)	See symbol specification tables 2, 4, 6, 8, and 10 for values	660 nm +/-10
ITF-14 (≥0.635 mm (0.025 in.) X)	GTIN-12, GTIN-13, GTIN-14	0.5 (D)	20 mils	660 nm +/-10
Composite	GTIN-8, GTIN-12, GTIN-13,GTIN-14 and other AIs	1.5 (C)	6 mils	660 nm +/-10
GS1 DataBar	GTIN-8, GTIN-12, GTIN-13,GTIN-14 and other AIs	1.5 (C)	See symbol specification tables 1, 2, 3, 4, 6, 8, <del>and</del> 10 and 11	660 nm +/-10
GS1 DataMatrix	Direct part marking, regulated healthcare retail or non-retail consumer trade items extended packaging	1.5 (C)	See symbol specification tables 6, 7, 8, 9, 10 and 11 Table 1 Addendum for values.	660 nm +/-10
GS1 QR Code	Direct part marking, custom trade item, extended packaging GDTI, and GSRN	1.5 (C)	See symbol specification table 1 Addendum, 7, 9, and 11 for values.	660 nm +/-10

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**5.5.2.7.1 Symbol specification table 1 - Trade items scanned in general retail POS and not general distribution**

154 **Figure 5.5.2.7.2-2. GS1 system symbol specification table 1**

Primary symbol(s) specified	X-dimension mm (inches)			(**) Minimum symbol height for given X mm (inches)			Quiet Zone		Minimum quality specification
	(*) Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
EAN-13	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	11X	7X	1.5/06/660
EAN-8	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	14.58 (0.574")	18.23 (0.718")	36.46 (1.435")	7X	7X	1.5/06/660
UPC-A	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	9X	1.5/06/660
UPC-E	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	7X	1.5/06/660
GS1 DataBar Omni-directional (****)	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	12.14 (0.478")	15.19 (0.598")	30.36 (1.195")	None	None	1.5/06/660
GS1 DataBar Stacked Omni-directional (***) (****)	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	25.10 (0.988")	31.37 (1.235")	62.70 (2.469")	None	None	1.5/06/660
GS1 DataBar Expanded	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	8.99 (0.354")	11.23 (0.442")	22.44 (0.883")	None	None	1.5/06/660
GS1 DataBar Expanded Stacked (*****)	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.75 (0.738")	23.44 (0.923")	46.86 (1.845")	None	None	1.5/06/660

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Primary Symbol(s) Specified Plus Add-on 2 or 5	X-dimension mm (inches)			(**) Minimum symbol height for given X mm (inches)			Quiet Zone	Min separation between symbols	Max separation between symbols	Quiet Zone	Min. Quality Spec.
	(*) Minimum	Target	Maximum	For min. X-dimension	For target X-dimension	For max. X-dimension					
EAN-13 + 2	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	11X	7X	12X	5X	1.5/06/ 660
EAN-13 + 5	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	11X	7X	12X	5X	1.5/06/ 660
UPC-A + 2	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	9X	12X	5X	1.5/06/ 660
UPC-A + 5	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	9X	12X	5X	1.5/06/ 660
UPC-E + 2	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	7X	12X	5X	1.5/06/ 660
UPC-E + 5	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	7X	12X	5X	1.5/06/ 660


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(*)	<p>These barcodes may only be printed using an X-dimension below 0.264 millimetre (0.0104 inch) under the following conditions:</p> <ul style="list-style-type: none"> <li>■ The allowance for X-dimensions between 0.249 millimetre (0.0098 inch) and 0.264 millimetre (0.0104 inch) is only applicable to on demand (e.g., thermal, laser) print processes. For all other printing processes, an X-dimension of 0.264 millimetre (0.0104 inch) is attainable and is the minimum allowable size.</li> <li>■ When printing a minimum symbol with any method of printing, the area provided for printing the symbol and the required Quiet Zone SHOULD never be less than the area required for an X-dimension of 0.264 millimetre (0.0104 inch).</li> </ul>
(**)	<ul style="list-style-type: none"> <li>■ The minimum symbol height dimensions listed for all symbologies including EAN/UPC symbols do not include the human readable interpretation.</li> <li>■ When printing a minimum symbol with any method of printing, the bar height SHALL never be truncated below the minimum as listed in the table above.</li> <li>■ Because of the operative scanning environment for EAN/UPC symbols, there is a direct relationship between the symbol's height and width. This means the minimum symbol height listed is tied to the minimum, target, and maximum X-dimension listed. There is no maximum for the height, but if the maximum X-dimension is used, the symbol height must be equal to or greater than those listed in the Minimum Symbol Height column.</li> <li>■ The minimum heights of EAN/UPC symbols do not include the extended bars: see section 5.2.1.4.2 for dimensions of the extended bars.</li> <li>■ For GS1 DataBar Expanded Stacked symbols, the table reflects the minimum symbol height for symbols that are two rows in height.</li> </ul>
(***)	<p>In addition to the factors above related to digital printing, one other exception is permitted; For loose produce being weighed at the point-of-sale (POS) using GS1 DataBar Stacked Omnidirectional minimum X-dimension of 0.203 millimetre (0.0080 inch) is permitted but may produce scanning performance reduction. However, for POS, this performance drop off is not noticeable when the product must be weighed at the point-of-sale. Even with a slower scanning performance to conduct the transaction, the weighing process takes longer than the scanning process. For that reason, a lower minimum X-dimension should never be used on products crossing point-of-sale which are not weighed as loose produce during the scan event.</p>
(****)	<p>The current symbol specification for GS1 DataBar Omnidirectional (minimum height 33X) and GS1 DataBar Stacked Omnidirectional (minimum height 69X) indicate a square aspect ratio for the symbol segments. To enhance scanning performance, in an omnidirectional scanning environment, an over square aspect ratio SHALL be used following the example of the EAN/UPC symbology specification and rigorous field test of the GS1 DataBar symbology (46X or 95X).</p>
(*****)	<p>For North American coupon codes using GS1 DataBar Expanded Stacked in 2 row and 3 row configurations the X-dimension may be as low as 0.0080" (0.203mm) as long as a minimum overall bar height of 1.020" (25.91mm) is maintained. X-dimensions less than 0.0100" (.254mm) might not always be feasible for all GS1 DataBar coupon barcodes due to variables, such as printing process, symbol orientation, and material. Due to the time sensitive nature of the coupon printing process, these variables should be considered during the design and barcode origination processes. Barcode verification should always be done from printing press proofs.</p>

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 **Note:** See section 2.7 to ensure the correct symbol specification table is used.

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In addition to the symbol used at general retail POS, an additional 2D symbol may be used to carry AI (8200). As AI (8200) has a mandatory association with GTIN, the GTIN within the symbol ensures compatibility with direct or indirect mode. GS1 DataMatrix is approved for all applications including regulated healthcare trade items covered by SSTs 6, 7, 8, ~~and 10 and 11~~, but for general retail consumer trade items, either GS1 QR Code or GS1 DataMatrix are GS1 approved options. When using 2D symbols to carry AI (8200) on general retail trade items, the following specifications are required.

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**Figure 5.5.2.7.2-3.** GS1 system symbol specification table 1 addendum for AI (8200)

Symbol(s) specified (**)	X-dimension mm (inches)			Minimum symbol height for given X mm (inches)			Quiet Zone Surrounding Symbol	Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension		
GS1 DataMatrix (ECC 200) (*)	0.396 (0.0150")	0.495 (0.0195")	0.743 (0.0293")	Height is determined by X-dimension and data that is encoded			1X on all four sides	1.5/12/660
GS1 QR Code (*)	0.396 (0.0150")	0.495 (0.0195")	0.743 (0.0293")	Height is determined by X-dimension and data that is encoded			4X on all four sides	1.5/12/660

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- (\*) 2D X-dimension - Optical effects in the image capture process require that the GS1 DataMatrix and GS1 QR Code symbols be printed at 1.5 times the equivalent X-dimension allowed for linear symbols.
- (\*\*) Where a linear symbol appears on the package, reverse and mirror-image representation of GS1 2D symbols SHALL NOT be permitted.

166 **5.5.2.7.2 Symbol specification table 2 - Trade items scanned in general distribution only**

167 **Figure 5.5.2.7.2-1. GS1 system symbol specification table 2**

Symbol(s) specified	(*) X-dimension mm (inches)			(**) Minimum symbol height for given X mm (inches)			Quiet Zone		(***) Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
EAN-13	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	11X	7X	1.5/10/660
EAN-8	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	27.35 (1.077")	36.46 (1.435")	36.46 (1.435")	7X	7X	1.5/10/660
UPC-A	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	9X	9X	1.5/10/660
UPC-E	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	9X	7X	1.5/10/660
ITF-14	0.495 (0.0195")	0.495 (0.0195")	1.016 (0.0400")	31.75 (1.250")	31.75 (1.250")	31.75 (1.250")	10X	10X	1.5/10/660
GS1-128	0.495 (0.0195")	0.495 (0.0195")	1.016 (0.0400")	31.75 (1.250")	31.75 (1.250")	31.75 (1.250")	10X	10X	1.5/10/660
GS1 DataBar Omni-directional	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	16.34 (0.644")	21.78 (0.858")	21.78 (0.858")	NA	NA	1.5/10/660
GS1 DataBar Stacked Omni-directional	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.16 (1.346")	45.54 (1.794")	45.54 (1.794")	NA	NA	1.5/10/660
GS1 DataBar Expanded	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	16.83 (0.663")	22.44 (0.884")	22.44 (0.884")	NA	NA	1.5/10/660
GS1 DataBar Expanded Stacked	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	35.15 (1.385")	46.86 (1.846")	46.86 (1.846")	NA	NA	1.5/10/660
GS1 DataBar Stacked	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	6.44 (0.254")	8.58 (0.338")	8.58 (0.338")	NA	NA	1.5/10/660
GS1 DataBar Limited	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	4.95 (0.195")	6.60 (0.260")	6.60 (0.260")	NA	NA	1.5/10/660
GS1 DataBar Truncated	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	6.44 (0.254")	8.58 (0.338")	8.58 (0.338")	NA	NA	1.5/10/660

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- (\*) UPC-E and EAN-8 symbols are designed for use on small packages. Whenever space permits, UPC-A, EAN-13, ITF-14, or GS1-128 symbols SHOULD be used in the General distribution scanning environment. The minimum symbol height dimensions listed for all symbologies including EAN/UPC symbols do not include the human readable interpretation (or bearer bars for ITF-14 symbols). The minimum heights of EAN/UPC symbols do not include the extended bars: see section 5.2.1.4.2 for dimensions of the extended bars. Because of the operative scanning environment for EAN/UPC symbols, there is a direct relationship between the symbol's height and width. This means the minimum symbol height is tied to the minimum, target, and maximum X-dimension listed.



ITF-14 symbols with X-dimensions below 0.635 millimetre (0.0250 inch) SHOULD NOT be printed directly on corrugate with conventional (plate-based) processes. The ITF-14 symbol's bar width ratio target is 2.5:1, and the acceptable range is 2.25:1 to 3:1.

GS1-128 symbols have a maximum symbol length of 165.10 millimetres (6.500 inch), which may impact the maximum achievable X-dimension. For example, a GS1-128 symbol containing an SSCC has a maximum achievable X-dimension for 0.940 millimetre (0.0370 inch)

For GS1-128 and ITF-14, a smaller X-Dimension may be used if there is absolutely no possibility of printing the full size barcode because the trade item is physically too small; the X-Dimension SHALL NOT be less than 0.250 millimetre (0.0098 inch). For details on barcode production and quality assessment see section 5.5.

(\*\*) For GS1-128 and ITF-14 symbols the minimum symbol height for General distribution scanning is always 31.75 millimetres (1.250 inch). The minimum symbol height dimensions relate to the bar heights only (do not include human readable interpretation text or ITF-14 symbol bearer bars).

If the trade item is physically too small to accommodate the minimum, for GS1-128 and ITF-14 the minimum height can be reduced to 12.70 millimetres (0.500 inch) or in case of further space constraints to no less than 5.08 millimetres (0.200 inch). For details on barcode production and quality assessment see section 5.5.

There is no maximum for the height, but if the maximum X-dimension is used, the symbol height must be equal to or greater than those listed in the Minimum Symbol Height column.

(\*\*\*) For ITF-14 symbols printed on labels with off-set, thermal, or laser print with an X-dimension 0.495 millimetre (0.0195 inch), the minimum quality specification is 1.5/10/660. For ITF-14 symbols printed directly on corrugate or labels with an X-dimension greater than or equal to 0.635 millimetre (0.0250 inch), the minimum quality specification is 0.5/20/660.

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**Note:** See section 2.7 to ensure the correct symbol specification table is used.

170 **5.5.2.7.3 Symbol specification table 3 - Trade items scanned at general retail POS and general**  
 171 **distribution**

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**Figure 0-1. GS1 system symbol specification table 3**

Symbol(s) specified	(*) X-dimension mm (inches)			(**) Minimum symbol height for given X mm (inches)			Quiet Zone		Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
EAN-13	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	11X	7X	1.5/06/660
EAN-8	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	27.35 (1.077")	36.46 (1.435")	36.46 (1.435")	7X	7X	1.5/06/660
UPC-A	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	9X	9X	1.5/06/660
UPC-E	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	9X	7X	1.5/06/660
GS1 DataBar Omni-directional (***)	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	22.77 (0.897")	30.36 (1.196")	30.36 (1.196")	None	None	1.5/06/660
GS1 DataBar Stacked Omni-directional (***)	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	47.03 (1.853")	62.70 (2.470")	62.70 (2.470")	None	None	1.5/06/660
GS1 DataBar Expanded	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	16.83 (0.663")	22.44 (0.884")	22.44 (0.884")	None	None	1.5/06/660
GS1 DataBar Expanded Stacked	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	35.15 (1.385")	46.86 (1.846")	46.86 (1.846")	None	None	1.5/06/660

173

(\*) UPC-E and EAN-8 symbols are designed for use on small packages. Whenever space permits, UPC-A and EAN-13 symbols SHOULD be used.



(\*\*) The minimum symbol height dimensions listed for all symbologies including EAN/UPC symbols do not include the human readable interpretation. The minimum heights of EAN/UPC symbols do not include the extended bars: see section 5.2.1.4.2 for dimensions of the extended bars. Because of the operative scanning environment for EAN/UPC symbols, there is a direct relationship between the symbol's height and width. This means the minimum symbol height listed is tied to the minimum, target, and maximum X-dimension listed. There is no maximum for the height, but if the maximum X-dimension is used, the symbol height must be equal to or greater than those listed in the Minimum Symbol Height column.

(\*\*\*) The current symbol specification for GS1 DataBar Omnidirectional (minimum height 33X) and GS1 DataBar Stacked Omnidirectional (minimum height 69X) indicate a square aspect ratio for the symbol segments. To enhance scanning performance, in an omnidirectional scanning environment, an over square aspect ratio SHALL be used following the example of the EAN/UPC symbology specification and rigorous field test of the GS1 DataBar symbology (46X or 95X).

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**Note:** See section 2.7 to ensure the correct symbol specification table is used.

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**5.5.2.7.4 Symbol specification table 4 – Trade items not scanned at POS or general retail - also not scanned in general distribution or regulated healthcare (retail or non-retail)**

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**Figure 5.5.2.7.4-1. GS1 system symbol specification table 4**

Symbol(s) specified	(*) X-dimension mm (inches)			(**) Minimum symbol height for given X mm (inches)			Quiet Zone		Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
EAN-13	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	11X	7X	1.5/06/660
EAN-8	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	14.58 (0.574")	18.23 (0.718")	36.46 (1.435")	7X	7X	1.5/06/660
UPC-A	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	9X	1.5/06/660
UPC-E	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	7X	1.5/06/660
GS1 DataBar Omnidirectional	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	8.71 (0.343")	10.90 (0.429")	21.78 (0.858")	NA	NA	1.5/06/660
GS1 DataBar Stacked Omnidirectional	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.24 (0.718")	27.78 (1.094")	45.54 (1.794")	NA	NA	1.5/06/660
GS1 DataBar Expanded	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	8.99 (0.354")	11.23 (0.442")	22.44 (0.883")	NA	NA	1.5/06/660
GS1 DataBar Expanded Stacked	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.75 (0.738")	23.44 (0.923")	46.86 (1.845")	NA	NA	1.5/06/660
GS1 DataBar Stacked	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	3.43 (0.135")	4.29 (0.169")	8.58 (0.338")	N/A	N/A	1.5/06/660
GS1 DataBar Limited	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	2.64 (0.104")	3.30 (0.130")	6.60 (0.260")	N/A	N/A	1.5/06/660
GS1 DataBar Truncated	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	3.43 (0.135")	4.29 (0.169")	8.58 (0.338")	N/A	N/A	1.5/06/660
ITF-14	0.250 (0.00984")	0.495 (0.0195")	0.495 (0.0195")	12.70 (0.500")	12.70 (0.500")	12.70 (0.500")	10X	10X	1.5/06/660
GS1-128	0.250 (0.00984")	0.495 (0.0195")	0.495 (0.0195")	12.70 (0.500")	12.70 (0.500")	12.70 (0.500")	10X	10X	1.5/06/660
GS1 DataMatrix (ECC 200) (***)	0.380 (0.0150")	0.380 (0.0150")	0.495 (0.0195")	Height is determined by X-dimension and data that is encoded			1X on all four sides		1.5/08/660
GS1 QR Code (***)	0.380 (0.0150")	0.380 (0.0150")	0.495 (0.0195")	Height is determined by X-dimension and data that is encoded			4X on all four sides		1.5/08/660



(\*) ITF-14 symbols with X-dimensions below 0.635 millimetre (0.0250 inch) SHOULD NOT be printed directly on corrugate with conventional (plate based) processes. The ITF-14 symbol's bar width ratio target is 2.5:1, and the acceptable range is 2.25:1 to 3:1.

Section 5.5.3.4 gives full details on when barcodes can be printed at less than the minimum X-dimension. In general, barcodes may only be printed using an X-dimension below 0.264 millimetre (0.0104 inch) or 80 percent magnification under the following conditions:

- The allowance for X-dimensions between 0.249 millimetre (0.0098 inch) or 75 percent magnification and 0.264 millimetre (0.0104 inch) or 80 percent magnification is only applicable to on demand (e.g., thermal, laser) print processes. For all other printing processes, an X-dimension of 0.264 millimetre (0.0104 inch) is attainable and is the minimum allowable size.
- When printing a minimum symbol with any method of printing, the area provided for printing the symbol and the required Quiet Zone should never be less than the area required for an X-dimension of 0.264 millimetre (0.0104 inch).
- When printing a minimum symbol with any method of printing, the symbol height SHALL never be truncated.

(\*\*) The minimum symbol height dimensions listed for all symbologies including EAN/UPC symbols do not include the human readable interpretation (or bearer bars for ITF-14 symbols), The minimum heights of EAN/UPC symbols do not include the extended bars: see section 5.2.1.4.2 for dimensions of the extended bars.

Because of the operative scanning environment for EAN/UPC symbols, there is a direct relationship between the symbol's height and width. This means the minimum symbol height listed is tied to the minimum, target, and maximum X-dimension listed.

The minimum bar height for ITF-14 and GS1-128 symbols in this operative scanning environment is 12.70 millimetres (0.500 inch), but if the package is physically too small to accommodate this rule, further truncation is permitted. In no case SHALL the bar height be less than 5.08 millimetres (0.200 inch).

There is no maximum for the symbol height, but if the maximum X-dimension is used, the symbol height must be equal to or greater than those listed in the Minimum Symbol Height column.

Whereas, linear symbol heights are set at a fixed dimension, Composite Components are printed at the same X-dimension as the linear portion of the Composite symbology, and the barcode height varies depending on the amount of data, the X-dimension, and which linear symbol is used in conjunction with the Composite Component. Note that Composite Components have to be printed with a linear symbol such as GS1 DataBar, GS1-128, UPC-A, or EAN-13. ITF-14 cannot be used with Composite Components.

(\*\*\*) 2D X-dimension - Optical effects in the image capture process require that the GS1 DataMatrix and GS1 QR Code symbols be printed at 1.5 times the equivalent printing X-dimension allowed for linear symbols.

179 **Note:** See section 2.7 to ensure the correct symbol specification table is used.

180 **5.5.2.7.5 Symbol specification table 5 – logistic units scanned in general distribution**

181 **Figure 5.5.2.7.5-1. GS1 system symbol specification table 5**

Symbol(s) specified	(*) X-dimension mm (inches)			(**) Minimum symbol height for given X mm (inches)			Quiet Zone		Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
GS1-128	0.495 (0.0195")	0.495 (0.0195")	0.940 (0.0370")	31.75 (1.250")	31.75 (1.250")	31.75 (1.250")	10X	10X	1.5/10/660

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(\*) If the logistic unit is physically too small to accommodate the minimum X-dimension, the minimum X-dimension is 0.250 millimetre (0.0098 inch). For details on barcode production and quality assessment see section 5.5.

(\*\*) The minimum symbol height indicated is for bar height only and does not include the human readable interpretation.

If the logistic unit is physically too small to accommodate the minimum, the minimum bar height is the greater of 15 percent of the symbol width including Quiet Zones or 12.70 millimetres (0.500 inch). If the package is physically too small to accommodate this rule, further truncation is permitted, but in no case SHALL the bar height be less than 5.08 millimetres (0.200 inch). For details on barcode production and quality assessment see section 5.5.

There is no maximum for the height, but if the maximum X-dimension is used, the symbol height must be equal to or greater than those listed in the Minimum Symbol Height column.



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**Note:** See section 2.7 to ensure the correct symbol specification table is used.

184 **5.5.2.7.6 Symbol specification table 6 - Regulated healthcare non-retail consumer trade items not**  
 185 **scanned in general distribution**

186 **Figure 5.5.2.7.6-1. GS1 system symbol specification table 6**

Symbol(s) specified	X-dimension mm (inches)			Minimum symbol height for given X mm (inches)			Quiet Zone		Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
GS1- 128	0.170 (0.0067")	0.495 (0.0195")	0.495 (0.0195")	12.70 (0.500")	12.70 (0.500")	12.70 (0.500")	10X	10X	1.5/06/660
GS1 DataMatrix (ECC 200) (*)	0.254 (0.0100")	0.380 (0.0150")	0.495 (0.0195")	Height is determined by X-dimension and data that is encoded			1X on all four sides		1.5/08/660
GS1 DataBar Omni-directional	0.170 (0.0067")	0.200 (0.0080")	0.660 (0.0260")	5.61 (0.221")	6.60 (0.260")	21.78 (0.858")	<i>Not Applicable</i>	<i>Not Applicable</i>	1.5/06/660
GS1 DataBar Truncated	0.170 (0.0067")	0.200 (0.0080")	0.660 (0.0260")	2.21 (0.087")	2.60 (0.102")	8.58 (0.338")	<i>Not Applicable</i>	<i>Not Applicable</i>	1.5/06/660
GS1 DataBar Stacked	0.170 (0.0067")	0.200 (0.0080")	0.660 (0.0260")	2.21 (0.087")	2.60 (0.102")	8.58 (0.338")	<i>Not Applicable</i>	<i>Not Applicable</i>	1.5/06/660
GS1 DataBar Stacked Omni-directional	0.170 (0.0067")	0.200 (0.0080")	0.660 (0.0260")	11.73 (0.462")	13.80 (0.543")	45.54 (1.794")	<i>Not Applicable</i>	<i>Not Applicable</i>	1.5/06/660
GS1 DataBar Limited	0.170 (0.0067")	0.200 (0.0080")	0.660 (0.0260")	1.70 (0.067")	2.00 (0.079")	6.60 (0.260")	<i>Not Applicable</i>	<i>Not Applicable</i>	1.5/06/660
GS1 DataBar Expanded	0.170 (0.0067")	0.200 (0.0080")	0.660 (0.0260")	5.78 (0.228")	6.80 (0.268")	22.44 (0.884")	<i>Not Applicable</i>	<i>Not Applicable</i>	1.5/06/660
GS1 DataBar Expanded Stacked	0.170 (0.0067")	0.200 (0.0080")	0.660 (0.0260")	12.07 (0.475")	14.20 (0.559")	46.86 (1.846")	<i>Not Applicable</i>	<i>Not Applicable</i>	1.5/06/660
EAN-13	0.170 (0.0067")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	11X	7X	1.5/06/660
EAN-8	0.170 (0.0067")	0.330 (0.0130")	0.660 (0.0260")	14.58 (0.574")	18.23 (0.718")	36.46 (1.435")	7X	7X	1.5/06/660
UPC-A	0.170 (0.0067")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	9X	1.5/06/660
UPC-E	0.170 (0.0067")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	7X	1.5/06/660
ITF-14	0.170 (0.0067")	0.495 (0.0195")	0.495 (0.0195")	12.70 (0.500")	12.70 (0.500")	12.70 (0.500")	10X	10X	1.5/06/660
CC-A	All CCs need to be printed at the same X-dimensions as their linear components, therefore consult the appropriate row and column for the linear symbol to be used.			Height is determined by X-dimension and data that is encoded			1X	1X	1.5/06/660
CC-B							1X	1X	1.5/06/660
CC-C							2X	2X	1.5/06/660

187

(\*) 2D X-dimension - Optical effects in the image capture process require that the GS1 DataMatrix symbol be printed at 1.5 times the equivalent printing X-dimension allowed for linear or Composite symbols.

188

**Note:** See section 2.7 to ensure the correct symbol specification table is used.

189

**Note:** This table contains several symbol options. All are permitted to promote backward compatibility, but section 2 application standards define which symbols are the preferred options for the future.

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192 **5.5.2.7.7 Symbol specification table 7 - Direct part marking**


193 **Figure 5.5.2.7.7-1. GS1 system symbol specification table 7**


Symbol(s) specified	X-dimension mm (inches) Note 1 Note 4			Minimum symbol height for given X mm (inches)	Quiet Zone	Minimum quality specification	
	Minimum	Target	Maximum				
GS1 DataMatrix	0.254 (0.0100")	0.300 (0.0118")	0.615 (0.0242")	Height is determined by X-dimension and data that is encoded	1X on all four sides	1.5/06/660 <b>Note 3</b>	For direct marking of items other than medical devices
GS1 QR Code	0.254 (0.0100")	0.300 (0.0118")	0.615 (0.0242")	Height is determined by X-dimension and data that is encoded	4X on all four sides	1.5/06/660 <b>Note 3</b>	For direct marking of items other than medical devices
GS1 DataMatrix Ink Based direct part marking	0.254 (0.0100")	0.300 (0.0118")	0.615 (0.0242")	Height is determined by X-dimension and data that is encoded	1X on all four sides	1.5/08/660 <b>Note 3</b>	For direct marking of medical devices such as small medical / surgical instruments
GS1 DataMatrix direct part marking - A <b>Note 2</b>	0.100 (0.0039")	0.200 (0.0079")	0.300 (0.0118")	Height is determined by X-dimension and data that is encoded	1X on all four sides	DPM1.5/04-12/650/(45Q 30Q 30T 30S 90) <b>Note 5</b>	For direct marking of medical devices such as small medical / surgical instruments
GS1 DataMatrix direct part marking - B <b>Note 2</b>	0.200 (0.0079")	0.300 (0.0118")	0.495 (0.0195")	Height is determined by X-dimension and data that is encoded	1X on all four sides	DPM1.5/08-20/650/(45Q 30Q 30T 30S 90) <b>Note 5</b>	For direct marking of small medical / surgical instruments


194  **Note:** The largest X-dimension in a given range that will allow a symbol with the needed data  
 195 content to fit within the available marking area should be used to maximise marking and reading  
 196 performance (depth of field, tolerance to curvature, etc.).

197 The angle is an additional parameter defining the angle of incidence (relative to the plane of the  
 198 symbol) of the illumination for direct part marking verification. It SHALL be included in the  
 199 overall symbol grade when the angle of incidence is other than 45 degrees. Its absence  
 200 indicates that the angle of incidence is 45 degrees. See ISO/IEC 15415 and ISO/IEC TR 29158  
 201 (AIM DPM).

202 In small instrument marking, mixed marking technologies used within the same scanning  
 203 environment should be avoided to ensure highest reading performance. Laser etching is  
 204 recommended for small instrument marking.


205  **Note 1:** Optical effects in the image capture process require that label based GS1 DataMatrix and  
 206 GS1 QR Code symbols be printed at approximately 1.5 times the equivalent X-dimension allowed  
 207 for linear symbols in the same application.

208  **Note 2:** There are two basic types of non ink based direct part marks, those with "connected  
 209 modules" in the "L" shaped finder pattern (GS1 DataMatrix direct part marking – A) created by  
 210 DPM marking technologies such as laser or chemical etching and those with "non connected  
 211 modules" in the "L" shaped finder pattern (GS1 DataMatrix direct part marking – B) created by  
 212 DPM marking technologies such as dot peen. Due to the marking technologies and characteristics  
 213 of reading they each have varied ranges of X-dimensions and different quality criteria  
 214 recommended and may require different reading equipment.  
 215 GS1 DataMatrix – A is suggested for marking of medical devices such as small medical /  
 216 surgical instruments. The Minimum X-dimension of 0.100mm is based upon the specific need  
 217 for permanence in direct marking of small medical instruments which have limited marking area  
 218 available on the instrument with a target useable area of 2.5mm x 2.5mm and a data content of  
 219 GTIN (AI 01) plus serial number (AI 21).

220  **Note 3:** The effective aperture for GS1 DataMatrix and GS1 QR Code quality measurements  
 221 SHOULD be taken at 80 percent of the minimum X-dimension allowed for the application. For




222 direct part marking - A this would equate to an aperture of 3; for direct part marking – B this  
 223 would equate to an aperture of 6 and for general healthcare label printing, an aperture of 8. See  
 224 *ISO/IEC 15415* and *ISO/IEC TR 29158*.

225  **Note 4:** In practical application, where very small symbol sizes are needed, it may be  
 226 necessary to work with GS1 DataMatrix module X-dimensions smaller than those suggested.  
 227 Where dimensional restrictions prohibit the application of a full size code, reduced X-dimension  
 228 AIDC marking is encouraged to facilitate information capture. It should be noted that these  
 229 practices may limit the symbol effectiveness, including but not limited to:

- the effect of smaller X-dimensions on reading performance,
- the need for, and limited availability of, special scanners/imagers for reading,
- special processes for marking,
- the overall cost considerations.

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 234 These smaller X-dimensions should therefore only be used internally or by mutual agreement  
 235 between trading partners

236  **Note 5:** Any "Type A" mark that meets the grade requirements under the quality techniques  
 237 specified in *ISO/IEC 15415* is considered acceptable. If the letters "DPM" precede the grade it  
 238 indicates that the grade was obtained by following *ISO/IEC TR 29158* (AIM DPM) and not *ISO/IEC*  
 239 *15415* whether "Type A" or "Type B".

240 **5.5.2.7.8 Symbol specification table 8 - Trade items scanned in retail pharmacy and general**  
 241 **distribution or non-retail pharmacy and general distribution**

242 **Figure 5.5.2.7.8-1.** GS1 system symbol specification table 8

Symbol(s) specified	X-dimension mm (inches)			Minimum symbol height for given X mm (inches)			Quiet Zone		Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
GS1- 128	0.495 (0.0195")	0.495 (0.0195")	1.016 (0.0400")	31.75 (1.250")	31.75 (1.250")	31.75 (1.250")	10X	10X	1.5/10/660
GS1 DataMatrix (ECC 200) (*)	0.750 (0.0300")	0.750 (0.0300")	1.520 (0.0600")	Height is determined by X-dimension and data that is encoded			1X on all four sides		1.5/20/660
EAN-13	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	11X	7X	1.5/10/660
EAN-8	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	27.35 (1.077")	36.46 (1.435")	36.46 (1.435")	7X	7X	1.5/10/660
UPC-A	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	9X	9X	1.5/10/660
UPC-E	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.28 (1.350")	45.70 (1.800")	45.70 (1.800")	9X	7X	1.5/10/660
ITF-14	0.495 (0.0195")	0.495 (0.0195")	1.016 (0.0400")	31.75 (1.250")	31.75 (1.250")	31.75 (1.250")	10X	10X	1.5/10/660
GS1 DataBar Omni-directional	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	16.34 (0.644")	21.78 (0.858")	21.78 (0.858")	Not Applicable	Not Applicable	1.5/10/660
GS1 DataBar Truncated	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	6.44 (0.254")	8.58 (0.338")	8.58 (0.338")	Not Applicable	Not Applicable	1.5/10/660
GS1 DataBar Stacked	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	6.44 (0.254")	8.58 (0.338")	8.58 (0.338")	Not Applicable	Not Applicable	1.5/10/660
GS1 DataBar Stacked Omni-directional	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	34.16 (1.346")	45.54 (1.794")	45.54 (1.794")	Not Applicable	Not Applicable	1.5/10/660





GS1 DataBar Limited	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	4.95 (0.195")	6.60 (0.260")	6.60 (0.260")	Not Applicable	Not Applicable	1.5/10/660
GS1 DataBar Expanded	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	16.83 (0.663")	22.44 (0.884")	22.44 (0.884")	Not Applicable	Not Applicable	1.5/10/660
GS1 DataBar Expanded Stacked	0.495 (0.0195")	0.660 (0.0260")	0.660 (0.0260")	35.15 (1.385")	46.86 (1.846")	46.86 (1.846")	Not Applicable	Not Applicable	1.5/10/660
CC-A	All CCs need to be printed at the same X- dimensions as their linear components, therefore consult the appropriate row and column for the linear symbol to be used.			Height is determined by X-dimension and data that is encoded			1X	1X	1.5/10/660
CC-B							1X	1X	1.5/10/660
CC-C							2X	2X	1.5/10/660

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(\*) 2D X-dimension - Optical effects in the image capture process require that the GS1 DataMatrix and GS1 QR Code symbols be printed at 1.5 times the equivalent printing X-dimension allowed for linear symbols.

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✔ **Note:** See section 2.7 to ensure the correct symbol specification table is used.

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✔ **Note:** This table contains several symbol options. All are permitted to promote backward compatibility, but section 2 application standards define which symbols are the preferred options for the future.

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✔ **Note:** Since June 2007 GS1 has recommended all trading partners in the healthcare sector invest exclusively in imaging-based scanners. Now that GS1 DataMatrix has been approved within the standard, it is important to inform all trading partners of a process within GS1 to establish target deployment dates. Without these dates, brand owners do not have a way to know when to deploy GS1 DataMatrix on their packaging and those needing to invest in scanning equipment may inadvertently purchase equipment that will not support the standards. To see GS1 healthcare's position paper on GS1 DataMatrix adoption, visit <http://www.gs1.org/healthcare>.

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### 256 5.5.2.7.9 Symbol specification table 9 - GS1 keys GDTI, GRAI, GIAI and GLN

257 **Figure 5.5.2.7.9-1. GS1 system symbol specification table 9**

Symbol(s) specified	X-dimensions mm(inches)			Minimum symbol height for given X mm(inches)			Quiet Zone		Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
GS1- 128	0.250 (0.0098")	0.250 (0.0098")	0.495 (0.0195")	12.70 (0.500")	12.70 (0.500")	12.70 (0.500")	10X	10X	1.5/06/660
GS1 DataMatrix (ECC 200) (*)	0.380 (0.0150")	0.380 (0.0150")	0.495 (0.0195")	Height is determined by X-dimension and data that is encoded			1X on all four sides		1.5/08/660
GS1 QR Code (*)	0.380 (0.0150")	0.380 (0.0150")	0.495 (0.0195")	Height is determined by X-dimension and data that is encoded			4X on all four sides		1.5/08/660

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(\*) 2D X-dimension - Optical effects in the image capture process require that the GS1 DataMatrix and GS1 QR Code symbols be printed at 1.5 times the equivalent printing X-dimension allowed for linear symbols.

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✔ **Note:** See section 2.7 to ensure the correct symbol specification table is used.

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✔ **Note:** This table contains several symbol options. All are permitted to promote backward compatibility, but section 2 application standards define which symbols are the preferred options for the future.

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**Note:** For location marking, barcodes may be printed at a higher maximum X-dimension: GS1-128 at 1.016 mm (0.0400 inches), GS1 DataMatrix and GS1 QR Code at 1.520 mm (0.0600 inches). See section 2.4.3.1.

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**5.5.2.7.10 Symbol specification table 10 – Regulated healthcare retail consumer trade items not scanned in general distribution**

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**Figure 5.5.2.7.10-1.** GS1 system symbol specification table 10

Symbol(s) specified	X-dimension mm (inches)			Minimum symbol height for given X mm (inches)			Quiet Zone		Minimum quality specification
	Minimum (*)	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
GS1- 128	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	12.70 (0.500")	12.70 (0.500")	12.70 (0.500")	10X	10X	1.5/06/660
GS1 DataMatrix (ECC 200) (**)	0.396 (0.0156")	0.495 (0.0195")	0.990 (0.0390")	Height is determined by X-dimension and data that is encoded			1X on all four sides		1.5/08/660
GS1 DataBar Omnidirectional	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	8.71 (0.343")	10.89 (0.429")	21.78 (0.858)	Not Applicable	Not Applicable	1.5/06/660
GS1 DataBar Truncated	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	3.43 (0.135")	4.29 (0.169")	8.58 (0.338")	Not Applicable	Not Applicable	1.5/06/660
GS1 DataBar Stacked	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	3.43 (0.135")	4.29 (0.169")	8.58 (0.338")	Not Applicable	Not Applicable	1.5/06/660
GS1 DataBar Stacked Omnidirectional	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.22 (0.718")	27.77 (0.897")	45.54 (1.794")	Not Applicable	Not Applicable	1.5/06/660
GS1 DataBar Limited	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	2.64 (0.104")	3.30 (0.130")	6.60 (0.260")	Not Applicable	Not Applicable	1.5/06/660
GS1 DataBar Expanded	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	8.98 (0.354")	11.22 (0.442")	22.44 (0.883")	Not Applicable	Not Applicable	1.5/06/660
GS1 DataBar Expanded Stacked	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.74 (0.738")	23.43 (0.923")	46.86 (1.846")	Not Applicable	Not Applicable	1.5/06/660
EAN-13	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	11X	7X	1.5/06/660
EAN-8	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	14.58 (0.574")	18.23 (0.718")	36.46 (1.435")	7X	7X	1.5/06/660
UPC-A	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	9X	1.5/06/660
UPC-E	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	18.28 (0.720")	22.85 (0.900")	45.70 (1.800")	9X	7X	1.5/06/660
ITF-14	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	12.70 (0.500")	12.70 (0.500")	12.70 (0.500")	10X	10X	1.5/06/660
CC-A	All CCs need to be printed at the same X- dimensions as their linear components, therefore consult the appropriate row and column for the linear symbol to be used.			Height is determined by X-dimension and data that is encoded			1X	1X	1.5/06/660
CC-B							1X	1X	1.5/06/660
CC-C							2X	2X	1.5/06/660

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(\*) These barcodes may only be printed using an X-dimension below 0.264 millimetre (0.0104 inch) under the following conditions:

- The allowance for X-dimensions between 0.249 millimetre (0.0098 inch) and 0.264 millimetre (0.0104 inch) is only applicable to on demand (e.g., thermal, laser) print processes. For all other printing processes, an X-dimension of 0.264 millimetre (0.0104 inch) is attainable and is the minimum allowable size.
- When printing a minimum symbol with any method of printing, the area provided for printing the symbol and the required Quiet Zone SHOULD never be less than the area required for an X-dimension of 0.264 millimetre (0.0104 inch).
- When printing a minimum symbol with any method of printing, the symbol height SHALL never be truncated below the minimum.



(\*\*) 2D X-dimension - Optical effects in the image capture process require that the GS1 DataMatrix and GS1 QR Code symbols be printed at 1.5 times the equivalent printing X-dimension allowed for linear symbols.

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✔ **Note:** See section 2.7 to ensure the correct symbol specification table is used.

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✔ **Note:** Since June 2007 GS1 has recommended all trading partners in the healthcare sector invest exclusively in imaging-based scanners. Now that GS1 DataMatrix has been approved within the standard, it is important to inform all trading partners of a process within GS1 to establish target deployment dates. Without these dates, brand owners do not have a way to know when to deploy GS1 DataMatrix on their packaging and those needing to invest in scanning equipment may inadvertently purchase equipment that will not support the standards. To see GS1 Healthcare’s Position Paper on GS1 DataMatrix adoption, visit [GS1.org\GS1Healthcare](http://GS1.org/GS1Healthcare).

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278 **5.5.2.7.11 Symbol specification table 11 – GS1 GSRNs**

279 **Figure 5.5.2.7.11-1. GS1 system symbol specification table 11**

Symbol(s) specified	X-dimensions mm(inches)			Minimum symbol height for given X mm(inches)			Quiet Zone		Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Left	Right	
GS1 DataBar Expanded (*)	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	8.99 (0.354")	11.23 (0.442")	22.44 (0.883")	None	None	1.5/06/660
GS1 DataBar Expanded Stacked (*)	0.264 (0.0104")	0.330 (0.0130")	0.660 (0.0260")	8.99 (0.354")	11.23 (0.442")	22.44 (0.883")	None	None	1.5/06/660
GS1- 128	0.170 (0.0067")	0.250 (0.0098")	0.495 (0.0195")	12.70 (0.500")	12.70 (0.500")	12.70 (0.500")	10X	10X	1.5/05/660
GS1 DataMatrix (ECC 200) (**)	0.254 (0.0100")	0.380 (0.0150")	0.495 (0.0195")	Height is determined by X-dimension and data that is encoded			1X on all four sides		1.5/08/660
GS1 QR Code (**)	0.254 (0.0100")	0.380 (0.0150")	0.495 (0.0195")	Height is determined by X-dimension and data that is encoded			4X on all four sides		1.5/08/660

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(\*) **GS1 DataBar Expanded & Expanded Stacked**—These dimensions refer to the Symbol Specification Table 1 - Trade items scanned in general retail POS and not general distribution.  
 These barcodes may only be printed using an X-dimension below 0.264 millimetre (0.0104 inch) under the following conditions:



- The allowance for X-dimensions between 0.249 millimetre (0.0098 inch) and 0.264 millimetre (0.0104 inch) is only applicable to on demand (e.g., thermal, laser) print processes. For all other printing processes, an X-dimension of 0.264 millimetre (0.0104 inch) is attainable and is the minimum allowable size.

When printing a minimum symbol with any method of printing, the area provided for printing the symbol and the required Quiet Zone SHOULD never be less than the area required for an X-dimension of 0.264 millimetre (0.0104 inch).

- The minimum symbol height dimensions listed for all symbologies do not include the human readable interpretation.
- When printing a minimum symbol with any method of printing, the bar height SHALL never be truncated below the minimum as listed in the table above.
- Because of the operative scanning environment for EAN/UPC symbols, there is a direct relationship between the symbol’s height and width. This means the minimum symbol height listed is tied to the minimum, target, and maximum X-dimension listed. There is no maximum for the height, but if the maximum X-dimension is used, the symbol height must be equal to or greater than those listed in the Minimum Symbol Height column.
- For GS1 DataBar Expanded Stacked symbols, the table reflects the minimum symbol height for symbols that are two rows in height.
- For GS1 DataBar Expanded Stacked in 2 row and 3 row configurations, the X-dimension may be as low as 0.0080" (0.203mm) as long as a minimum overall bar height of 1.020" (25.91mm) is maintained.

(\*\*) 2D X-dimension - Optical effects in the image capture process require that the GS1 DataMatrix and GS1 QR Code symbols be printed at 1.5 times the equivalent printing X-dimension allowed for linear symbols.



- 281  **Note:** See section 2.7 to ensure the correct symbol specification table is used.
- 282  **Note:** This table contains several symbol options. All are permitted to promote backward compatibility, but section 2 application standards define which symbols are the preferred options for the future.
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