

---

---

**Information technology — Automatic  
identification and data capture  
techniques — GS1 DataBar bar code  
symbology specification**

*Technologies de l'information — Techniques automatiques  
d'identification et de capture des données — Spécifications de la  
symbologie des codes à barres GS1 DataBar*

**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

Foreword .....	v
Introduction.....	vi
<b>1</b> <b>Scope</b> .....	<b>1</b>
<b>2</b> <b>Normative references</b> .....	<b>1</b>
<b>3</b> <b>Terms, definitions, abbreviated terms and mathematical operators</b> .....	<b>2</b>
3.1 <b>Terms and definitions</b> .....	<b>2</b>
3.2 <b>Abbreviated terms</b> .....	<b>3</b>
3.3 <b>Mathematical operators and notational conventions</b> .....	<b>3</b>
<b>4</b> <b>Symbol description</b> .....	<b>3</b>
4.1 <b>Types of GS1 DataBar symbol</b> .....	<b>3</b>
4.2 <b>Symbology characteristics</b> .....	<b>4</b>
4.3 <b>Summary of additional features</b> .....	<b>4</b>
4.4 <b>Symbol structure</b> .....	<b>5</b>
<b>5</b> <b>Symbol requirements for GS1 DataBar Omnidirectional, GS1 DataBar Truncated, GS1 DataBar Stacked and GS1 DataBar Stacked Omnidirectional</b> .....	<b>5</b>
5.1 <b>Basic characteristics of GS1 DataBar Omnidirectional</b> .....	<b>5</b>
5.2 <b>Symbol structure of GS1 DataBar Omnidirectional</b> .....	<b>6</b>
5.2.1 <b>Symbol character structure</b> .....	<b>7</b>
5.2.2 <b>Symbol character value</b> .....	<b>7</b>
5.2.3 <b>Symbol value</b> .....	<b>8</b>
5.2.4 <b>Finder patterns</b> .....	<b>10</b>
5.2.5 <b>Reference decode algorithm</b> .....	<b>11</b>
5.3 <b>Variations for specific applications</b> .....	<b>14</b>
5.3.1 <b>GS1 DataBar Truncated</b> .....	<b>14</b>
5.3.2 <b>Two-row variations</b> .....	<b>14</b>
<b>6</b> <b>Symbol requirements for GS1 DataBar Limited</b> .....	<b>15</b>
6.1 <b>Basic characteristics</b> .....	<b>15</b>
6.2 <b>Symbol structure</b> .....	<b>16</b>
6.2.1 <b>Symbol character structure</b> .....	<b>17</b>
6.2.2 <b>Symbol character value</b> .....	<b>17</b>
6.2.3 <b>Symbol value</b> .....	<b>18</b>
6.2.4 <b>Check character</b> .....	<b>19</b>
6.2.5 <b>Finder pattern</b> .....	<b>19</b>
6.2.6 <b>Reference decode algorithm</b> .....	<b>19</b>
<b>7</b> <b>Symbol requirements for GS1 DataBar Expanded and GS1 DataBar Expanded Stacked</b> .....	<b>21</b>
7.1 <b>Basic characteristics of GS1 DataBar Expanded</b> .....	<b>21</b>
7.2 <b>Symbol structure</b> .....	<b>22</b>
7.2.1 <b>Overall symbol structure</b> .....	<b>22</b>
7.2.2 <b>Symbol character structure</b> .....	<b>23</b>
7.2.3 <b>Symbol character value</b> .....	<b>23</b>
7.2.4 <b>Symbol binary value</b> .....	<b>24</b>
7.2.5 <b>Data encodation</b> .....	<b>25</b>
7.2.6 <b>Check character</b> .....	<b>34</b>
7.2.7 <b>Finder pattern</b> .....	<b>35</b>
7.2.8 <b>GS1 DataBar Expanded Stacked</b> .....	<b>37</b>
7.2.9 <b>Reference decode algorithm</b> .....	<b>38</b>
<b>8</b> <b>Symbol quality</b> .....	<b>40</b>
8.1 <b>Linear symbology parameters</b> .....	<b>40</b>

8.2	Additional pass/fail criteria.....	40
8.3	Stacked symbols.....	40
9	Transmitted data.....	41
10	Human readable interpretation.....	41
11	Minimum and Maximum width of a module (X) .....	41
12	Application-defined parameters.....	41
Annex A	(normative) Check digit calculation.....	42
Annex B	(normative) C-language element width encoder and decoder.....	43
Annex C	(normative) GS1 DataBar Limited check character element widths .....	47
Annex D	(normative) Splitting long GS1 DataBar Expanded or GS1 DataBar Expanded Stacked symbols for GS1 emulation mode.....	50
Annex E	(informative) Symbol elements.....	51
Annex F	(informative) Encoding examples.....	55
F.1	GS1 DataBar Omnidirectional and GS1 DataBar Truncated .....	55
F.2	GS1 DataBar Limited .....	57
F.3	GS1 DataBar Expanded.....	58
Annex G	(informative) C-language element width decoder .....	60
Annex H	(informative) Minimizing misreads.....	63
H.1	General.....	63
H.2	Voting.....	64
H.3	Decoding by row .....	64
H.4	Consistency checks .....	64
H.5	GS1 DataBar Limited Decoding Considerations .....	65
H.5.1	Original reference decode algorithm concerning guard bars.....	65
H.5.2	Potential to misread UPC-A symbols .....	65
H.5.3	Methods to prevent misreads of UPC-A symbols .....	66
Annex I	(informative) Printing considerations .....	69
I.1	Guard pattern considerations .....	69
I.2	Pixel-based printing .....	69
I.3	Guidance to users of pixel-based printing software.....	70
I.4	Process control considerations .....	70
I.5	Separation of multiple symbols .....	71
I.6	Printing the separator pattern .....	71
Annex J	(informative) GS1 DataBar Symbology — Summary of Characteristics .....	72
Bibliography	.....	73

## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 24724 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

This second edition cancels and replaces the first edition (ISO/IEC 24724:2006), which has been technically revised.

## Introduction

GS1 DataBar was formerly known as “Reduced Space Symbology (RSS)” and is renamed to align with the name of the GS1 organization.

The GS1 DataBar family contains three types of linear symbologies to be used with the GS1 system. The first type has four variations (GS1 DataBar Omnidirectional, GS1 DataBar Truncated, GS1 DataBar Stacked and GS1 DataBar Stacked Omnidirectional). The stacked variations are two-row symbols. The second type comprises only one variation, namely GS1 DataBar Limited. The third type has two variations: a single row variation (GS1 DataBar Expanded) and a multi-row stacked variation (GS1 DataBar Expanded Stacked). The use of GS1 DataBar is intended to comply with the GS1 application guidelines as defined in the GS1 General Specifications.

GS1 DataBar Omnidirectional and GS1 DataBar Stacked Omnidirectional encode a 14-digit GS1 item identification (often referred to as a Global Trade Item Number, or GTIN) in a linear symbol that can be scanned omnidirectionally by suitably programmed point-of-sale scanners. GS1 DataBar Truncated and GS1 DataBar Stacked encode a 14-digit GS1 item identification in a linear symbol and are not suitable for omnidirectional scanning. GS1 DataBar Limited encodes a 14-digit GS1 item identification with a leading digit of zero or one in a linear symbol for use on small items that will not be scanned at the point-of-sale. GS1 DataBar Expanded encodes GS1 item identification plus supplementary application identifier element strings such as weight and “best before” date in a linear symbol that can be scanned omnidirectionally by suitably programmed point-of-sale scanners.

Any member of the GS1 DataBar family can be printed as a stand-alone linear symbol or as part of a GS1 Composite symbol with an accompanying two-dimensional component printed above the GS1 DataBar linear component.

GS1 DataBar symbols are intended for encoding identification numbers and data supplementary to the identification. The administration of the numbering system by GS1 ensures that identification codes assigned to particular items are unique worldwide and that they and the associated supplementary data are defined in a consistent way. The major benefit for the users of the GS1 system is the availability of uniquely defined identification codes and supplementary data formats for use in their trading transactions.

# Information technology — Automatic identification and data capture techniques — GS1 DataBar bar code symbology specification

## 1 Scope

This International Standard defines the requirements for the GS1 DataBar symbology family. It specifies the characteristics of the GS1 DataBar symbology family, data character encodation, symbol formats, dimensions, print quality requirements, error detection, and decoding algorithms.

For GS1 Composite symbols, ISO/IEC 24723 defines the two-dimensional component.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 646, *Information technology — ISO 7-bit coded character set for information interchange*

ISO 4217, *Codes for the representation of currencies and funds*

ISO/IEC 15416, *Information technology — Automatic identification and data capture techniques — Bar code print quality test specification — Linear symbols*

ISO/IEC 15417, *Information technology — Automatic identification and data capture techniques — Code 128 bar code symbology specification*

ISO/IEC 15420, *Information technology — Automatic identification and data capture techniques — EAN/UPC bar code symbology specification*

ISO/IEC 19762-1, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to AIDC*

ISO/IEC 19762-2, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 2: Optically readable media (ORM)*

ISO/IEC 24723, *Information technology — Automatic identification and data capture techniques — GS1 Composite bar code symbology specification*