Advanced scanner configuration

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Table of contents

Revision: 2.1 , technical changes excepted

Introduction

This booklet describes the programmable parameters, and provides bar codes for programming the SpeechMike- or DPM 9600 series click on barcode scanner module.

Operational Parameters

The barcode scanner is shipped with the factory default settings shown in Table 1. These factory default values are stored in non-volatile memory and are preserved even when the scanner is powered down.

To change the parameter values:

Scan the appropriate bar codes included in this chapter. The new values replace the existing memory values. The factory default values can be recalled by scanning the RESTORE DEFAULTS bar code on page 7.
Table 1 lists the factory defaults for all parameters. To change any option, scan the appropriate bar code(s).

Table 1: Factory Default Table

Parameter	Factory Default
Set Factory Default	All Defaults
Beeper Volume	Medium
Beeper Tone	Medium Frequency
Beeper Frequency Adjustment	2500 Hz
Beep After Good Decode	Enable
Transmit "No Read" Message	Disable
Parameter Scanning	Enable
Linear Code Type Security Levels	1
Bi-directional Redundancy	Disable
Bi-directional Redundancy	Disable
UPC/EAN	
UPC-A	Enable
UPC-E	Enable
UPC-E1	Disable
EAN-8	Enable
EAN-13	Enable
Bookland EAN	Disable
Decode UPC/EAN Supplementals	Ignore
Decode UPC/EAN Supplemental Redundancy	7

Revision: 2.1 , technical changes excepted

Parameter	Factory Default
Transmit UPC-A Check Digit	Enable
Transmit UPC-E Check Digit	Enable
Transmit UPC-E1 Check Digit	Enable
UPC-A Preamble	System Character
UPC-E Preamble	System Character
UPC-E1 Preamble	System Character
Convert UPC-E to A	Disable
Convert UPC-E1 to A	Disable
EAN-8 Zero Extend	Disable
Convert EAN-8 to EAN-13 Type	Type is EAN-13
UPC/EAN Security Level	0
UCC Coupon Extended Code	Disable
Code 128	
Code-128	Enable
UCC/EAN-128	Enable
ISBT 128	Enable
Code 39	
Code 39	Enable
Trioptic Code 39	Disable
Convert Code 39 to Code 32	Disable
Code 32 Prefix	Disable
Set Length(s) for Code 39	2-55
Code 39 Check Digit Verification	Disable
Transmit Code 39 Check Digit	Disable
Code 39 Full ASCII Conversion	Disable
Code 93	
Code 93	Disable
Set Length(s) for Code 93	4-55
Code 11	
Code 11	Disable
Set Lengths for Code 11	4 to 55

Revision: 2.1 , technical changes excepted

Parameter	Factory Default
Code 11 Check Digit Verification	Disable
Transmit Code 11 Check Digit(s)	Disable
Interleaved 2 of 5	
Interleaved 2 of 5	Enable
Set Length(s) for I 2 of 5	14
I 2 of 5 Check Digit Verification	Disable
Transmit I 2 of 5 Check Digit	Disable
Convert I 2 of 5 to EAN 13	Disable
Discrete 2 of 5	
Discrete 2 of 5	Disable
Set Length(s) for D 2 of 5	12
Chinese 2 of 5	
Chinese 2 of 5	Disable
Codabar	
Codabar	Disable
Set Lengths for Codabar	5-55
CLSI Editing	Disable
NOTIS Editing	Disable
MSI	
MSI	Disable
Set Length(s) for M SI	6-55
MSI Check Digits	One
Transmit MSI Check Digit	Disable
MSI Check Digit Algorithm	Mod 10/Mod 10
RSS	
RSS-14	Disable
RSS-Limited	Disable
RSS-Expanded	Disable

Revision: 2.1 , technical changes excepted

Set Default Parameter

Default Parameters

The barcode scanner can be reset to the factory defaults. Scan the bar code below to reset the scanner to its default settings.

Restore Defaults

Beeper Volume

To select a decode beep volume, scan the appropriate bar code.

Low

Medium

High

Beeper Tone

To select a decode beep frequency (tone), scan the appropriate bar code.

Low Frequency

*Medium Frequency

High Frequency

Beeper Frequency Adjustment

This parameter adjusts the frequency of the high beeper tone from the nominal 2500 Hz to another frequency matching the resonances of the installation. It is programmable in
10 Hz increments from 1220 Hz to 3770 Hz.

To increase the frequency, scan the bar code below, then scan three numeric bar codes beginning on page 51 that correspond to the desired frequency adjustment divided by 10. For example, to set the frequency to 3000 Hz (an increase of 500 Hz), scan numeric bar codes 0, 5, 0, corresponding to 50, or (500/10).

To decrease the frequency, scan the bar code below, then scan three numeric bar codes beginning on page 51 that correspond to the value (256 - desired adjustment/10). For example, to set the frequency to 2000 Hz (a decrease of 500 Hz), scan numeric bar codes 2, 0, 6, corresponding to 206, or (256 - 500/10).

To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

Beeper Frequency Adjustment
(Default: 2500 Hz)

Beep After Good Decode

Scan this symbol to set the scanner to beep after a good decode.

*Beep After Good Decode

Scan this symbol to set the scanner not to beep after a good decode. The beeper still operates during parameter menu scanning and indicates error conditions.

Do Not Beep After Good Decode

Transmit "No Read" Message

Enable this option to transmit "NR" if a symbol does not decode during the timeout period or before the trigger is released. Any enabled prefix or suffixes are appended around this message.

Enable No Read

When disabled, and a symbol cannot be decoded, no message is sent to the host.

*Disable No Read

Parameter Scanning

To disable decoding of parameter bar codes, scan the bar code below. The `Set Defaults` parameter bar code can still be decoded. To enable decoding of parameter bar codes, scan *Enable Parameter Scanning or Set Factory Defaults.*.

*Enable Parameter Scanning

Disable Parameter Scanning

Linear Code Type Security Level

The barcode scanner offers four levels of decode security for linear code types (e.g. Code 39, Interleaved 2 of 5). Select higher security levels for decreasing levels of bar code quality. As security levels increase, the scanner's aggressiveness decreases.

Select the security level appropriate for your bar code quality.

Linear Security Level 1

The following code types must be successfully read twice before being decoded:

Code Type	Length
Codabar	All
MSI	4 or less
D 2 of 5	8 or less
I 2 of 5	8 or less

*Linear Security Level 1

Linear Security Level 2

All code types must be successfully read twice before being decoded.

Linear Security Level 2

Revision: 2.1 , technical changes excepted

Linear Security Level 3

Code types other than the following must be successfully read twice before being decoded. The following codes must be read three times:

Code Type	Length
MSI	4 or less
D 2 of 5	8 or less
I 2 of 5	8 or less

Linear Security Level 3

Linear Security Level 4

All code types must be successfully read three times before being decoded.

Linear Security Level 4

Bi-directional Redundancy

This parameter is only valid when a *Linear Code Type Security Level* is enabled. When this parameter is enabled, a bar code must be successfully scanned in both directions (forward and reverse) before being decoded.

Enable Bi-directional Redundancy

*Disable Bi-directional Redundancy

Revision: 2.1 , technical changes excepted

U P C/EAN

Enable/Disable UPC-A

To enable or disable UPC-A, scan the appropriate bar code below.
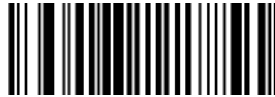
*Enable UPC-A

Disable UPC-A

Enable/Disable UPC-E

To enable or disable UPC-E, scan the appropriate bar code below.

*Enable UPC-E

Disable UPC-E

Enable/Disable UPC-E1

To enable or disable UPC-E1, scan the appropriate bar code below.

Note: UPC-E1 is not a UCC (Uniform Code Council) approved symbology.

Enable UPC-E1

*Disable UPC-E1

Enable/Disable EAN-8

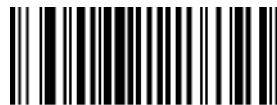To enable or disable EAN-8, scan the appropriate bar code below.

*Enable EAN-8

Disable EAN-8

Enable/Disable EAN- 13

To enable or disable EAN-13, scan the appropriate bar code below.

*Enable EAN-13

Disable EAN-13

Enable/Disable Bookland EAN

To enable or disable EAN Bookland, scan the appropriate bar code below.

Enable Bookland EAN

*Disable Bookland EAN

Decode UPC/EAN Supplementals

Supplementals are appended characters (2 or 5) according to specific code format conventions (e.g., UPC A+2, UPC E+2).

Several options are available:

- ▪ **Decode UPC/EAN with Supplemental** characters is selected, the scanner does not decode UPC/EAN symbols without supplemental characters.

- ▪ **Ignore UPC/EAN with Supplemental** characters is selected, and the SE-955 is presented with a UPC/EAN symbol with a supplemental, the scanner decodes the UPC/EAN and ignores the supplemental characters.

- ▪ **Autodiscriminate UPC/EAN Supplementals** is selected, scan Autodiscriminate UPC/EAN Supplementals on page 16, then select a value from the numeric bar codes beginning on page 51. A value of 5 or more is recommended.

- ▪ elect **Enable 378/379 Supplemental Mode** to enable the SE-955 to identify supplementals for EAN-1 3 bar codes starting with a '378' or '379' prefix only. All other UPC/EAN bar codes are decoded immediately and the supplemental characters ignored.

- ▪ elect **Enable 978 Supplemental Mode** to enable the SE-955 to identify supplementals for EAN-1 3 bar codes starting with a '978' prefix only. All other UPC/EAN bar codes are decoded immediately and the supplemental characters ignored.

- ▪ elect **Enable Smart Supplemental Mode** to enable the SE-955 to identify supplementals for EAN-1 3 bar codes starting with a '378', '379', or '978' prefix only. All other UPC/EAN bar codes are decoded immediately and the supplemental characters ignored.

Note: To minimize the risk of invalid data transmission, we recommend selecting whether to read or ignore supplemental characters.

Select the desired option by scanning one of the following bar codes.

Decode UPC/EAN With Supplementals

*Ignore UPC/EAN With Supplementals

Decode UPC/EAN Supplementals (continued)

||||| |||||| ||| ||||| ||||| |||||

Autodiscriminate UPC/EAN Supplementals

||||| |||||| ||| ||||| ||||| |||||

Enable 378/379 Supplemental Mode

||||| |||||| ||| ||||| ||||| |||||

Enable 978 Supplemental Mode

||||| |||||| ||| ||||| ||||| |||||

Enable Smart Supplemental Mode

Decode UPC/EAN Supplemental

With *Autodiscriminate UPC/EAN Supplementals* selected, this option adjusts the number of times a symbol without supplementals will be decoded before transmission. The range is from 2 to 30 times. Five or above is recommended when decoding a mix of UPC/ EAN symbols with and without supplementals, and the autodiscriminate option is selected.

Scan the bar code below to select a decode redundancy value. Next scan two numeric bar codes beginning on page 51. Single digit numbers must have a leading zero. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

||||| |||||| ||| ||||| ||||| |||||

**Decode UPC/EAN
Supplemental Redundancy
(Default: 7)**

Transmit UPC-A Check Digit

Scan the appropriate bar code below to transmit the symbol with or without the UPC-A check digit.

*Transmit UPC-A Check Digit

Do Not Transmit UPC-A Check Digit

Transmit UPC-E Check Digit

Scan the appropriate bar code below to transmit the symbol with or without the UPC-E check digit.

*Transmit UPC-E Check Digit

Do Not Transmit UPC-E Check Digit

Transmit UPC-E1 Check Digit

Scan the appropriate bar code below to transmit the symbol with or without the UPC-E1 check digit.

*Transmit UPC-E1 Check Digit

Do Not Transmit UPC-E1 Check Digit

UPC-A Preamble

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-A symbol. Select one of the following options for transmitting UPC-A preamble to the host device: transmit system character only, transmit system character and country code ("0" for USA), or transmit no preamble.

No Preamble
(<DATA>)

*System Character
(<SYSTEM CHARACTER> <DATA>)

System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)

UPC-E Preamble

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-E symbol. Select one of the following options for transmitting UPC-E preamble to the host device: transmit system character only, transmit system character and country code ("0" for USA), or transmit no preamble.

No Preamble
(<DATA>)

*System Character
(<SYSTEM CHARACTER> <DATA>)

System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)

UPC-E1 Preamble

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-E1 symbol. Select one of the following options for transmitting UPC-E1 preamble to the host device: transmit system character only, transmit system character and country code ("0" for USA), or transmit no preamble.

No Preamble
(<DATA>)

*System Character
(<SYSTEM CHARACTER> <DATA>)

System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)

Convert UPC-E to UPC-A

Enable this parameter to convert UPC-E (zero suppressed) decoded data to UPC-A format before transmission. After conversion, data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Scan **DO NOT CONVERT UPC-E TO UPC-A** to transmit UPC-E (zero suppressed) decoded data.

Convert UPC-E to UPC-A (Enable)

*Do Not Convert UPC-E to UPC-A (Disable)

Revision: 2.1 , technical changes excepted

Convert UPC-E1 to UPC-A

Enable this parameter to convert UPC-E1 (zero suppressed) decoded data to UPC-A format before transmission. After conversion, data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Scan **DO NOT CONVERT UPC-E TO UPC-A** to transmit UPC-E1 (zero suppressed) decoded data.

Convert UPC-E1 to UPC-A (Enable)

*Do Not Convert UPC-E1 to UPC-A (Disable)

EAN Zero Extend

When enabled, this parameter adds five leading zeros to decoded EAN-8 symbols to make them compatible in format to EAN-13 symbols.
Disable this parameter to transmit EAN-8 symbols as is.

Enable EAN Zero Extend

*Disable EAN Zero Extend

Revision: 2.1 , technical changes excepted

Convert EAN-8 to EAN-13 Type

When EAN Zero Extend is enabled, you can label the extended symbol as either an
EAN-1 3 bar code, or an EAN-8 bar code. This affects *Transmit Code ID Character* and *DECODE_DATA*
message.
When EAN Zero Extend is disabled, this parameter has no effect on bar code data.

*Type Is EAN-13

Type Is EAN-8

UPC/EAN Security Level

The SE-955 offers four levels of decode security for UPC/EAN bar codes. Increasing levels of security are provided
for decreasing levels of bar code quality. Select higher levels of security for decreasing levels of bar code quality.
Increasing security decreases the scanner's aggressiveness; so choose only that level of security necessary for the
application.
UPC/EAN Security Level 0
This default setting allows the scanner to operate in its most aggressive state, while providing sufficient security in
decoding most "in-spec" UPC/EAN bar codes.

*UPC/EAN Security Level 0

UPC/EAN Security Level 1
As bar code quality levels diminish, certain characters become prone to mis-decodes before others (i.e., 1, 2, 7, 8).
If mis-decodes of poorly printed bar codes occur, and the mis-decodes are limited to these characters, select this
security level.

UPC/EAN Security Level 1

Revision: 2.1 , technical changes excepted

UPC/EAN Security Level 2

If mis-decodes of poorly printed bar codes occur, and the mis-decodes are not limited to characters 1, 2, 7, and 8, select this security level.

UPC/EAN Security Level 2

UPC/EAN Security Level 3

If misdecodes still occur after selecting Security Level 2, select this security level. Be advised, selecting this option is an extreme measure against mis-decoding severely out of spec bar codes. Selection of this level of security significantly impairs the decoding ability of the scanner. If this level of security is necessary, try to improve the quality of the bar codes.

UPC/EAN Security Level 3

UCC Coupon Extended Code

The UCC Coupon Extended Code is an additional bar code adjacent to a UCC Coupon Code. To enable or disable UCC Coupon Extended Code, scan the appropriate bar code below.

Enable UCC Coupon Extended Code

*Disable UCC Coupon Extended Code

Revision: 2.1 , technical changes excepted

Code 128

Enable/Disable Code 128

To enable or disable Code 128, scan the appropriate bar code below.

*Enable Code 128

Disable Code 128

Enable/Disable UCC/EAN- 128

To enable or disable UCC/EAN-128, scan the appropriate bar code below.

*Enable UCC/EAN-128

Disable UCC/EAN-128

Revision: 2.1 , technical changes excepted

Enable/Disable ISBT 128

To enable or disable ISBT 128, scan the appropriate bar code below.

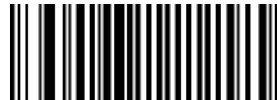*Enable ISBT 128

Disable ISBT 128

Lengths for Code 128

No length setting is required for Code 128.

Code 39

Enable/Disable Code 39

To enable or disable Code 39, scan the appropriate bar code below.

*Enable Code 39

Disable Code 39

Enable/Disable Trioptic Code 39

Trioptic Code 39 is a variant of Code 39 used in marking computer tape cartridges. Trioptic Code 39 symbols always contain six characters.
To enable or disable Trioptic Code 39, scan the appropriate bar code below.

Enable Trioptic Code 39

*Disable Trioptic Code 39

Note: Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously. If an error beep sounds when enabling Trioptic Code 39, disable Code 39 Full ASCII and try again.

Convert Code 39 to Code 32 (Italian Pharma Code)

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Scan the appropriate bar code below to enable or disable converting Code 39 to Code 32.

Note: Code 39 must be enabled in order for this parameter to function.

Enable Convert Code 39 to Code 32

*Disable Convert Code 39 to Code 32

Revision: 2.1 , technical changes excepted

Code 32 Prefix

Enable this parameter to add the prefix character "A" to all Code 32 bar codes. *Convert Code 39 to Code 32 (Italian Pharma Code)* must be enabled for this parameter to function.

Enable Code 32 Prefix

*Disable Code 32 Prefix

Set Lengths for Code 39

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for Code 39 may be set for any length, one or two discrete lengths, or lengths within a specific range. If Code 39 Full ASCII is enabled, **Length Within a Range** or **Any Length** are the preferred options. When setting lengths, single digit numbers must always be preceded by a leading zero.

One Discrete Length - This option limits decodes to only those Code 39 symbols containing a selected length. Lengths are selected from the numeric bar codes beginning on page 51. For example, to decode only Code 39 symbols with 14 characters, scan **Code 39 - One Discrete Length,** then scan **1** followed by **4.** To change the selection or cancel an incorrect entry, scan **Cancel** on page 51.

Code 39 - One Discrete Length

Two Discrete Lengths - This option limits decodes to only those Code 39 symbols containing either of two selected lengths. Lengths are selected from the numeric bar codes beginning on page 51. For example, to decode only those Code 39 symbols containing either 2 or 14 characters, select **Code 39 - Two Discrete Lengths,** then scan **0, 2, 1,** and then **4.** To change the selection or cancel an incorrect entry, scan **Cancel** on page 51.

Code 39 - Two Discrete Lengths

Revision: 2.1 , technical changes excepted

Length Within Range - This option limits decodes to only those Code 39 symbols within a specified range. For example, to decode Code 39 symbols containing between 4 and 12 characters, first scan **Code 39 - Length Within Range.** Then scan **0, 4, 1,** and **2.** Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan **Cancel** on page 51.

Code 39 - Length Within Range

Any Length - Scan this option to decode Code 39 symbols containing any number of characters.

Code 39 - Any Length

Code 39 Check Digit Verification

When this feature is enabled, the scanner checks the integrity of all Code 39 symbols to verify that the data complies with specified check digit algorithm. Only those Code 39 symbols which include a modulo 43 check digit are decoded. Only enable this feature if your Code 39 symbols contain a module 43 check digit.
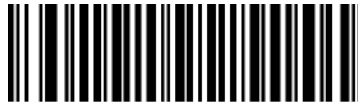
Verify Code 39 Check Digit

*Do Not Verify Code 39 Check Digit

Revision: 2.1 , technical changes excepted

Transmit Code 39 Check Digit

Scan this symbol to transmit the check digit with the data.

Transmit Code 39 Check Digit (Enable)

Scan this symbol to transmit data without the check digit.

*Do Not Transmit Code 39 Check Digit (Disable)

Enable/Disable Code 39 Full ASCI

Code 39 Full ASCII is a variant of Code 39 which pairs characters to encode the full ASCII character set.
To enable or disable Code 39 Full ASCII, scan the appropriate bar code below.
Refer to Table B-3 on page B-5 for the mapping of Code 39 characters to ASCII values.

Enable Code 39 Full ASCII

*Disable Code 39 Full ASCII

 Note: Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously. If you get an error beep when enabling Code 39 Full ASCII, disable Trioptic Code 39 and try again.

Code 93

Enable/Disable Code 93

To enable or disable Code 93, scan the appropriate bar code below.

Enable Code 93

*Disable Code 93

Set Lengths for Code 93

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for Code 93 may be set for any length, one or two discrete lengths, or lengths within a specific range.

One Discrete Length - Select this option to decode only those codes containing a selected length. For example, select **Code 93 One Discrete Length,** then scan **1, 4,** to limit the decoding to only Code 93 symbols containing 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

Code 93 - One Discrete Length

Two Discrete Lengths - Select this option to decode only those codes containing two selected lengths. For example, select **Code 93 Two Discrete Lengths,** then scan **0, 2, 1, 4,** to limit the decoding to only Code 93 symbols containing 2 or 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

Code 93 - Two Discrete Lengths

Length Within Range - This option sets the unit to decode a code type within a specified range. For example, to decode Code 93 symbols containing between 4 and 12 characters, first scan **Code 93 Length Within Range,** then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

Code 93 - Length Within Range

Any Length - Scan this option to decode Code 93 symbols containing any number of characters.

Code 93 - Any Length

Code 11

Enable/Disable Code 11

To enable or disable Code 11, scan the appropriate bar code below.

Enable Code 11

Disable Code 11

Set Lengths for Code 11

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 11 to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length -** Select this option to decode only Code 11 symbols containing a selected length. Select the length using the numeric bar codes in *Numeric Bar Codes on page 51.* For example, to decode only Code 11 symbols with 14 characters, scan **Code 11 - One Discrete Length,** then scan **1** followed by **4.** To correct an error or to change the selection, scan **Cancel** on page 52.

- **Two Discrete Lengths -** Select this option to decode only Code 11 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in *Numeric Bar Codes on page 51.* For example, to decode only those Code 11 symbols containing either 2 or 14 characters, select **Code 11 - Two Discrete Lengths,** then scan **0, 2, 1,** and then **4.** To correct an error or to change the selection, scan **Cancel** on page 52.

- **Length Within Range -** Select this option to decode a Code 11 symbol with a specific length range. Select lengths using numeric bar codes in *Numeric Bar Codes on page 51.* For example, to decode Code 11 symbols containing between 4 and 12 characters, first scan **Code 11 - Length Within Range.** Then scan **0, 4, 1,** and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** on page 52.

- **Any Length -** Scan this option to decode Code 11 symbols containing any number of characters within the scanner capability.

Code 11 - One Discrete Length

Code 11 - Two Discrete Lengths

Revision: 2.1 , technical changes excepted

Code 11 - Length Within Range

Code 11 - Any Length

Code 11 Check Digit Verification

This feature allows the scanner to check the integrity of all Code 11 symbols to verify that the data complies with the specified check digit algorithm. This selects the check digit mechanism for the decoded Code 11 bar code. The options are to check for one check digit, check for two check digits, or disable the feature.

To enable this feature, scan the bar code below corresponding to the number of check digits encoded in your Code 11 symbols.

*Disable

One Check Digit

Two Check Digits

Transmit Code 11 Check Digits

This feature selects whether or not to transmit the Code 11 check digit(s).

Transmit Code 11 Check Digit(s) (Enable)

*Do Not Transmit Code 11 Check Digit(s) (Disable)
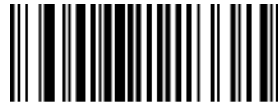
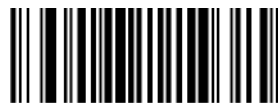**Note:** Code 11 Check Digit Verification must be enabled for this parameter to function.

Interleaved 2 of 5

Enable/Disable Interleaved 2 of 5

To enable or disable Interleaved 2 of 5, scan the appropriate bar code below.

*Enable Interleaved 2 of 5

Disable Interleaved 2 of 5

Set Lengths for Interleaved 2 of 5

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for I 2 of 5 may be set for any length, one or two discrete lengths, or lengths within a specific range.
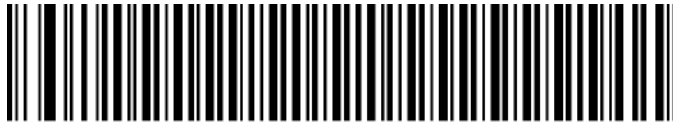
Note: When setting lengths, single digit numbers must always be preceded by a leading zero.

One Discrete Length - Select this option to decode only those codes containing a selected length. For example, select **I 2 of 5 One Discrete Length,** then scan **1, 4,** to decode only I 2 of 5 symbols containing 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

I 2 of 5 - One Discrete Length

Two Discrete Lengths - Select this option to decode only those codes containing two selected lengths. For example, select **I 2 of 5 Two Discrete Lengths,** then scan **0, 6, 1, 4,** to decode only I 2 of 5 symbols containing 6 or 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

I 2 of 5 - Two Discrete Lengths

Length Within Range - Select this option to decode only codes within a specified range. For example, to decode I 2 of 5 symbols containing between 4 and 12 characters, first scan **I 2 of 5 Length Within Range,** then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

I 2 of 5 - Length Within Range

Any Length - Scan this option to decode I 2 of 5 symbols containing any number of characters.

Note: Selecting this option may lead to misdecodes for I 2 of 5 codes.

I 2 of 5 - Any Length

Revision: 2.1 , technical changes excepted

I 2 of 5 Check Digit Verification

When enabled, this parameter checks the integrity of an I 2 of 5 symbol to ensure it complies with a specified algorithm, either USS (Uniform Symbology Specification), or OPCC (Optical Product Code Council).

*Disable

USS Check Digit

OPCC Check Digit

Transmit I 2 of 5 Check Digit

Scan this symbol to transmit the check digit with the data.

Transmit I 2 of 5 Check Digit (Enable)

Scan this symbol to transmit data without the check digit.

*Do Not Transmit I 2 of 5 Check Digit (Disable)

Revision: 2.1 , technical changes excepted

Convert I 2 of 5 to EAN-13

This parameter converts a 14 character I 2 of 5 code into EAN-13, and transmits to the host as EAN-13. To accomplish this, I 2 of 5 must be enabled, one length must be set to 14, and the code must have a leading zero and a valid EAN-13 check digit.

```
Convert I 2 of 5 to EAN-13 (Enable)
```

```
*Do Not Convert I 2 of 5 to EAN-13 (Disable)
```

Discrete 2 of 5

Enable/Disable Discrete 2 of 5

To enable or disable Discrete 2 of 5, scan the appropriate bar code below.

```
Enable Discrete 2 of 5
```

```
*Disable Discrete 2 of 5
```

Revision: 2.1 , technical changes excepted

Set Lengths for Discrete 2 of 5

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for D 2 of 5 may be set for any length, one or two discrete lengths, or lengths within a specific range.

One Discrete Length - Select this option to decode only those codes containing a selected length. For example, select **D 2 of 5 One Discrete Length,** then scan **1, 4,** to decode only D 2 of 5 symbols containing 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

D 2 of 5 - One Discrete Length

Two Discrete Lengths - Select this option to decode only those codes containing two selected lengths. For example, select **D 2 of 5 Two Discrete Lengths,** then scan **0, 2, 1, 4,** to decode only D 2 of 5 symbols containing 2 or 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

D 2 of 5 - Two Discrete Lengths

Length Within Range - Select this option to decode codes within a specified range. For example, to decode D 2 of 5 symbols containing between 4 and 12 characters, first scan **D 2 of 5 Length Within Range,** then scan **0, 4, 1** and **2** (single digit numbers must be preceded by a leading zero). Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

D 2 of 5 - Length Within Range

Any Length - Scan this option to decode D 2 of 5 symbols containing any number of characters.

Note: Selecting this option may lead to misdecodes for D 2 of 5 codes.

D 2 of 5 - Any Length

Revision: 2.1 , technical changes excepted

Chinese 2 of 5

Enable/Disable Chinese 2 of 5

To enable or disable Chinese 2 of 5, scan the appropriate bar code below.

Enable Chinese 2 of 5

*Disable Chinese 2 of 5

Codabar

Enable/Disable Codabar

To enable or disable Codabar, scan the appropriate bar code below.

Enable Codabar

*Disable Codabar

Set Lengths for Codabar

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for Codabar may be set for any length, one or two discrete lengths, or lengths within a specific range.

One Discrete Length - Select this option to decode only those codes containing a selected length. For example, select **Codabar One Discrete Length,** then scan **1, 4,** to decode only Codabar symbols containing 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

Codabar - One Discrete Length

Two Discrete Lengths - This option sets the unit to decode only those codes containing two selected lengths. For example, select **Codabar Two Discrete Lengths,** then scan **0, 2, 1, 4,** to decode only Codabar symbols containing 6 or 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

Codabar - Two Discrete Lengths

Length Within Range - Select this option to decode a code within a specified range. For example, to decode Codabar symbols containing between 4 and 12 characters, first scan **Codabar Length Within Range,** then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

Codabar - Length Within Range

Any Length - Scan this option to decode Codabar symbols containing any number of characters.

Codabar - Any Length

Revision: 2.1 , technical changes excepted

CLSI Editing

When enabled, this parameter strips the start and stop characters and inserts a space after the first, fifth, and tenth characters of a 14-character Codabar symbol.

Note: Symbol length does not include start and stop characters.

Enable CLSI Editing

*Disable CLSI Editing

NOTIS Editing

When enabled, this parameter strips the start and stop characters from decoded Codabar symbol.

Enable NOTIS Editing

*Disable NOTIS Editing

MSI

Enable/Disable MSI

To enable or disable M SI, scan the appropriate bar code below.

Enable MSI

*Disable MSI

Set Lengths for MSI

The length of a code refers to the number of characters (i.e., human readable characters) the code contains, and includes check digits. Lengths for MSI can be set for any length, one or two discrete lengths, or lengths within a specific range. See Table B-5 on page B-9 for ASCII equivalents.

One Discrete Length - Select this option to decode only those codes containing a selected length. For example, select **MSI Plessey One Discrete Length,** then scan **1, 4,** to decode only M SI Plessey symbols containing 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

MSI - One Discrete Length

Two Discrete Lengths - Select this option to decode only those codes containing two selected lengths. For example, select **MSI Plessey Two Discrete Lengths,** then scan **0, 6, 1, 4,** to decode only M SI Plessey symbols containing 6 or 14 characters. Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

MSI - Two Discrete Lengths

Revision: 2.1 , technical changes excepted
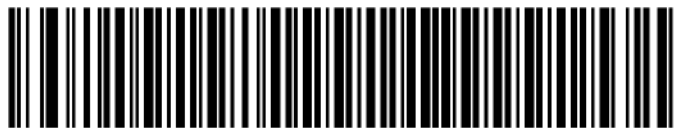
Length Within Range - Select this option to decode codes within a specified range. For example, to decode M SI symbols containing between 4 and 12 characters, first scan **MSI Length Within Range,** then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 51. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

MSI - Length Within Range

Any Length - Scan this option to decode MSI Plessey symbols containing any number of characters.

Note: . Selecting this option may lead to misdecodes for MSI codes.

MSI - Any Length

MSI Check Digits

These check digits at the end of the bar code verify the integrity of the data. At least one check digit is always required. Check digits are not automatically transmitted with the data.

*One MSI Check Digit

If two check digits is selected, also select an *MSI Check Digit Algorithm.* See page 44.

Two MSI Check Digit

Revision: 2.1 , technical changes excepted

Transmit MSI Check Digit

Scan this symbol to transmit the check digit with the data.

Transmit MSI Check Digit (Enable)

Scan this symbol to transmit data without the check digit.

*Do Not Transmit MSI Check Digit (Disable)

MSI Check Digit Algorithm

When the Two M SI check digits option is selected, an additional verification is required to ensure integrity. Select one of the following algorithms.

MOD 10/ MOD 11

*MOD 10/ MOD 10

RSS

Enable/Disable RSS- 14

To enable or disable RSS-14, scan the appropriate bar code below.

Enable RSS-14

*Disable RSS-14

Enable/Disable RSS-Limited

To enable or disable RSS-Limited, scan the appropriate bar code below.

Enable RSS-Limited

*Disable RSS-Limited

Enable/Disable RSS-Expanded

To enable or disable RSS-Expanded, scan the appropriate bar code below.

Enable RSS-Expanded

*Disable RSS-Expanded

Revision: 2.1 , technical changes excepted

Transmit Code ID Character

A code ID character identifies the code type of a scanned bar code. This can be useful when decoding more than one code type. The code ID character is inserted between the prefix character (if selected) and the decoded symbol.

Select no code ID character, a Symbol Code ID character, or an AIM Code ID character. The Symbol Code ID characters are listed below; see *next page* for *AIM Code Identifiers.*
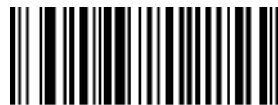
- A = UPC-A, UPC-E, UPC-E1, EAN-8, EAN-1 3
- B = Code 39, Code 32
- C = Codabar
- D = Code 128, ISBT 128
- E = Code 93
- F = Interleaved 2 of 5
- G = Discrete 2 of 5
- J = MSI
- K = UCC/EAN-128
- L = Bookland EAN
- M = Trioptic Code 39
- N = Coupon Code
- R = RSS-14, RSS-Limited, RSS-Expanded

Symbol Code ID Character

Aim Code ID Character

*None

AIM Code Identifiers

Each AIM Code Identifier contains the three-character string **] c m** where:

]   = Flag Character (ASCII 93)
c   = Code Character (see Table B-1)
m   = Modifier Character (see Table B-2).

Table B-1. Code Characters

Code Character	Code Type
A	Code 39
C	Code 128
E	UPC/EAN
F	Codabar
G	Code 93
H	Code 11
I	Interleaved 2 of 5
M	MSI
S	D2 of 5, IATA 2 of 5
X	Code 39 Trioptic, Bookland EAN
e	RSS

The modifier character is the sum of the applicable option values based on the following table.

Table B-2. Modifier Characters

Code Type	Option Value	Option
Code 39		
	0	No Check character or Full ASCII processing.
	1	Reader has checked one check character.
	3	Reader has checked and stripped check character.
	4	Reader has performed Full ASCII character conversion.
	5	Reader has performed Full ASCII character conversion and checked one check character.
	7	Reader has performed Full ASCII character conversion and checked and stripped check character.
	Example: A Full ASCII bar code with check character W, A+I+MI+DW, is transmitted as]A7AimId where 7 = (3+4).	

Intercharacter Delay

The intercharacter delay gives the host system time to service its receiver and perform other tasks between characters. Select the intercharacter delay option matching host requirements. The delay period can range from no delay to 99 msec in 1 msec increments. After scanning the bar code below, scan two bar codes beginning on page 51 to set the desired time-out. To change the selection or cancel an incorrect entry, scan the *Cancel* bar code on page 51.

Intercharacter Delay
(Default: 0 sec.)

Numeric Bar Codes

For parameters requiring specific numeric values, scan the appropriately numbered bar code(s).

0

1

2

3

4

5

6

7

8

9

Cancel

To change the selection or cancel an incorrect entry, scan the bar code below.

Cancel

GLOSSARY

Aperture	An opening which limits the amount of light or radiation passing through an optical system.
ASCII	American Standard Code for Information Interchange. A 7 bit-plus-parity code representing128 letters, numerals, punctuation marks, and control characters. It is a standard data transmission code in the U.S.
Auto discrimination	The ability of an interface controller to determine the code type of a scanned bar code. After this determination is made, the information content can be decoded.
Bar	The dark element in a printed bar code symbol.
Bar Code Density	The number of characters represented per unit of measurement(e.g., characters per inch).
Bar Height	The dimension of a bar measured perpendicular to the bar width.
Bar Width	Thickness of a bar measured from the edge closest to the symbol start character to the trailing edge of the same bar.
Baud Rate	A measure of the data flow or number of signaling events occurring per second. When one bit is the standard "event," this is a measure of bits per second (bps). For example, a baud rate of 50 means transmission of 50 bits of data per second.
Bit	Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.
Byte	On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through7, with bit 0 the low-order bit. One byte in memory can be used to store one ASCII character.
CDRH	Center for Devices and Radiological Health. A federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.
CDRH Class 1	This is the lowest power CDRH laser classification. CDRH Class 1 devices are safe under reasonably foreseeable conditions of operation. Software and other controls to limit exposure to laser light may be required to achieve CDRH Class 1 operation. The CDRH time base for Class 1 devices is 10,000 seconds.
CDRH Class 2	CDRH Class 2 devices may not emit more than 1 milliWatt average radiant power. For this scan engine, additional software controls are not necessary. Eye protection for CDRH Class 2devices is normally afforded by aversion responses, including the blink reflex.
Character	A pattern of bars and spaces which either directly represents data or indicates a control function, such as a number, letter, punctuation mark, or communications control contained in a message.
Character Set	Those characters available for encodation in a particular bar code symbology.

Check Digit	A digit used to verify a correct symbol decode. The scanner inserts the decoded data into an arithmetic formula and checks that the resulting number matches the encoded check digit. Check digits are required for UPC but are optional for other symbologies. Using check digits decreases the chance of substitution errors when a symbol is decoded.
CLSI Editing	An option which inserts a space after the 1st, 5th, and 10th characters of a 14-characterCodabar symbol. Length includes start and stop characters.
Codabar	A discrete self-checking code with a character set consisting of digits 0 to 9 and six additional characters: (- $: / , +).
Code 128	A high density symbology which allows the controller to encode all 128 ASCII characters without adding extra symbol elements.
Code 3 of 9 (Code 39)	A versatile and widely used alphanumeric bar code symbology with a set of 43 character types, including all uppercase letters, numerals from 0 to 9, and 7 special characters (- . / +% $ and space). The code name is derived from the fact that 3 of 9 elements representing a character are wide, while the remaining 6 are narrow.
Code 93	An industrial symbology compatible with Code 39 but offering a full character ASCII set and a higher coding density than Code 39.
Code Length	Number of data characters in a bar code between the start and stop characters, not including those characters.
Continuous Code	A bar code or symbol in which all spaces within the symbol are parts of characters. There are no intercharacter gaps in a continuous code. The absence of gaps allows for greater information density.
CTS	Clear to send.
Dead Zone	An area within a scanner's field of view, in which specular reflection may prevent a successful decode.
Decode	To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.
Decode Algorithm	A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.
Depth of Field	The range between minimum and maximum distances at which a scanner can read a symbol with a certain minimum element width.
Digitized Bar Pattern(DBP)	A digital representation of a decoded bar code.
Discrete 2 of 5	A binary bar code symbology representing each character by a group of five bars, two of which are wide. The location of wide bars in the group determines which character is encoded; spaces are insignificant. Only numeric characters (0 to 9) and START/STOP characters may be encoded.
Discrete Code	A bar code or symbol in which the spaces between characters (intercharacter gaps) are not part of the code.
EAN	European Article Number. This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.

Revision: 2.1 , technical changes excepted

Element	Generic term for a bar or space.
Encoded Area	Total linear dimension occupied by all characters of a code pattern, including start/stop characters and data.
Host Computer	A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs, and network control.
IEC	International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.
IEC (825) Class 1	This is the lowest power IEC laser classification. IEC Class 1 devices are safe under reasonably foreseeable conditions of operation. Software and other controls to limit exposure to laser light may be required to achieve IEC Class 1 operation. The IEC time base for Class 1 devices is 100 seconds if intentional viewing of laser light is not required in the design or function of the device. The IEC time base for Class 1 devices is 30,000 seconds where intentional viewing of laser light is inherent in the design or function of the device.
IEC (825) Class 2	IEC Class 2 devices may not emit more than 1 milliWatt average radiant power. For this scan engine, additional software controls are not necessary. Eye protection for IEC Class 2 devices is normally afforded by aversion responses, including the blink reflex.
Intercharacter Gap	The space between two adjacent bar code characters in a discrete code.
Interleaved Bar Code	A bar code in which characters are paired together, using bars to represent the first character and the intervening spaces to represent the second.
Interleaved 2 of 5	A binary bar code symbology representing character pairs in groups of five bars and five interleaved spaces. Interleaving provides for greater information density. The location of wide elements (bar/spaces) within each group determines which characters are encoded. This continuous code type uses no intercharacter spaces. Only numeric (0 to 9) and START/ STOP characters may be encoded.
LASER	**Light Amplification by Stimulated Emission of Radiation.** The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.
Laser Diode	A gallium-arsenide semiconductor type of laser connected to a power source to generate a laser beam. This laser type is a compact source of coherent light.
LED Indicator	A semiconductor diode (LED - Light Emitting Diode) used as an indicator, often in digital displays. The semiconductor uses applied voltage to produce light of a certain frequency determined by the semiconductor's particular chemical composition.
MIL	1 mil = 1 thousandth of an inch.
Misread (Misdecode)	A condition, which occurs when the data output of a reader or interface controller does not agree with the data encoded within a bar code symbol.
MSI	A numeric-only bar code type. It can accept a variable number of digits up to 13. MSI consists of four bars and four adjacent spaces. Each bar\space pair consists

of one information bit. A zero bit consists of a narrow bar followed by a wide space, while one bit consist of a wide bar followed by a narrow bar. The zero bit is one unit bar followed by a two-unit space and the one bit is a two-unit bar followed by a one unit space. The primary application for the MSI code is marking of retail shelves and subsequent scanning with portable devices for inventory purposes.

Nominal	The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value.
Nominal Size	Standard size for a bar code symbol. Most UPC/EAN codes can be used over a range of magnifications (e.g., from 0.80 to 2.00 of nominal).
NOTIS Editing	An option that strips the start and stop characters from a decoded Codabar symbol.
Parameter	A variable that can have different values assigned to it.
Percent Decode	The average probability that a single scan of a bar code would result in a successful decode. In a well-designed bar code scanning system, that probability should approach near 100%.
Print Contrast Signal (PCS)	Measurement of the contrast (brightness difference) between the bars and spaces of a symbol. A minimum PCS value is needed for a bar code symbol to be scannable. PCS = (RL - RD) / RL, where RL is the reflectance factor of the background and RD the reflectance factor of the dark bars.
Programming Mode	The state in which a scanner is configured for parameter values. See *Scanning Mode*.
Quiet Zone	A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character.
Random Access Memory (RAM)	Memory devices where any location in memory can be accessed as quickly as any other location.
Reflectance	Amount of light returned from an illuminated surface.
Resolution	The narrowest element dimension which can be distinguished by a particular reading device or printed with a particular device or method.
RTS	Request to send.
RxD	Received data.
Scan Area	Area intended to contain a symbol.
Scanner	An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are: Light source (laser or photoelectric cell) - illuminates a bar code. Photo detector - registers the difference in reflected light (more light reflected from spaces). Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.
Scanning Mode	The scanner is energized, programmed, and ready to read a bar code.

Revision: 2.1 , technical changes excepted

Scanning Sequence   A method of programming or configuring parameters for a bar code reading system by scanning bar code menus.

Self-Checking Code   A symbology that uses a checking algorithm to detect encoding errors within the characters of a bar code symbol.

Space   The lighter element of a bar code formed by the background between bars.

Specular Reflection   The mirror-like reflection of light from a surface which can "blind" a scanner.

Start/Stop Character   A pattern of bars and spaces that provides the scanner with start and stop reading instructions and scanning direction. The start and stop characters are normally to the left and right margins of a horizontal code.

Substrate   A foundation material on which a substance or image is placed.

Symbol   A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters, and check characters.

Symbol Aspect Ratio   The ratio of symbol height to symbol width.

Symbol Height   The distance between the outside edges of the quiet zones of the first row and the last row.

Symbol Length   Length of symbol measured from the beginning of the quiet zone (margin) adjacent to the start character to the end of the quiet zone (margin) adjacent to a stop character.

Symbology   The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39).

Tolerance   Allowable deviation from the nominal bar or space width.

TxD   Transmitted data.

UPC   Universal Product Code. A relatively complex numeric symbology. Each character consists of two bars and two spaces, each of which can be any of four widths. The standard symbology for retail food packages in the United States.

Visible Laser Diode (VLD) A solid state device which produces visible laser light. Laser light emitted from the diode has a wavelength of 630 - 680 nanometers.

Revision: 2.1 , technical changes excepted