



Spectralink PIVOT Smartphone

# PIVOT 8753 Barcode Administration Guide

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## Warranty

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# Introduction

This is your guide to understanding how barcode technology works in conjunction with the PIVOT 8753 handsets and how to deploy it in your facility.

Refer to this document when you need to configure your handsets for a barcode application or when you need to change a barcode configuration due to advances or changes in the technology.

Be aware that this is a living document. Barcode technology changes rapidly and this document makes every effort to keep up. If you have questions, please contact your Spectralink service provider.

## Product Support

Spectralink wants you to have a successful installation. If you have questions please contact the Customer Support Hotline at 1-800-775-5330.

The hotline is open Monday through Friday, 6 a.m. to 6 p.m. Mountain time.

For Technical Support: <mailto:technicalsupport@spectralink.com>

For Knowledge Base:

[http://support.spectralink.com/SpectralinkService/support/us/support/voice/wi-fi/spectralink\\_8400\\_wireless.html](http://support.spectralink.com/SpectralinkService/support/us/support/voice/wi-fi/spectralink_8400_wireless.html)

For Return Material Authorization: <mailto:nalarma@spectralink.com>

## Spectralink References

PIVOT documents are available on the Spectralink support site at <http://support.spectralink.com/pivot>.

### Specific Documents

AP Configuration Guides show you how to correctly configure access points and WLAN controllers (if applicable) and identify the optimal settings that support Spectralink 87-Series smartphones. The guides are available on the View Certified page on the Spectralink support site at <http://support.spectralink.com/view>.

*Quick Network Connect Administration Guide* QNC provides step-by-step instructions for configuring wireless settings required for the smartphones to associate with the wireless LAN. QNC software and documents are available on the Spectralink support site at <http://support.spectralink.com/products/wi-fi/gnc>.

*PIVOT by Spectralink CMS Administration Guide* The CMS Admin Guide provides information about every setting and option available to the administrator on CMS. Time-saving shortcuts, troubleshooting tips and other important maintenance instructions are also found in this document. CMS software and documents are available on the Spectralink support site at <http://support.spectralink.com/cms>.

*PIVOT by Spectralink Deployment Guide* The Deployment Guide provides sequential information for provisioning and deploying the smartphones. It covers deployment using QNC and CMS as well as manual deployment.

*PIVOT by Spectralink Configuration Guide* The PIVOT Configuration Guide provides detailed information about PIVOT menu items that have been developed specifically for the PIVOT smartphone.

*PIVOT by Spectralink Wi-Fi Security Implementation Guide* Wi-Fi security prevents unauthorized over-the-air access to network components and the sensitive data that resides there. This Guide discusses the various method and explains how to implement each of them.

*PIVOT 8744 Barcode Administration Guide* This Administration Guide supports the PIVOT 8744 model which includes the onboard camera which can be configured to function as a barcode scanner. It provides information about supported symbologies for this model.

*PIVOT 8753 Barcode Administration Guide* This Administration Guide supports the PIVOT 8753 model which incorporates a barcode reader. It provides detailed information about supported symbologies for this model.

*PIVOT by Spectralink QBC Administration Guide* Provides instruction for implementation of the Quick Barcode Connector application. The *PIVOT by Spectralink User Guide* contains information about using with the smartphone feature.

*PIVOT by Spectralink Application Installation Guide* The Applications Installation Guide provides detailed information about deploying any type of application, using an app store or MDM and manual processes for loading applications on the Spectralink 87-Series smartphone.

*PIVOT by Spectralink User Guide* The User Guide provides detailed information about using the features of the 87-Series smartphones.

*PIVOT by Spectralink Web Developer's Guide* The Web Developer's Guide provides Web application creators with information for developing and deploying Web applications that interface with Spectralink smartphones.

For information on IP PBX and softswitch vendors, see *PIVOT by Spectralink Call Server Interoperability Guide*.

## Barcode Reference

*The Bar Code Book: A Comprehensive Guide to Reading, Printing, Specifying, Evaluating, and Using Bar Code and Other Machine-Readable Symbols* by Roger C. Palmer, Fifth Edition

The book describes the many different forms of 1-D and 2-D bar code symbols, explains how they work, compares their attributes, and provides detailed reference information. Equipment used for printing, reading, and evaluating bar code symbols is reviewed, and extensive information is provided about the applicable industry standards. The emerging fields of Direct Part Marking and image-based scanning is reviewed, and the issue of patents is presented. Many applications of the technology are described.

## Conventions Used In This Document

### Icons

Icons indicate extra information about nearby text.



#### Caution

The *Caution* icon highlights information you need to know to avoid a hazard that could potentially impact device performance, application functionality, successful feature configuration and/or affect handset or network performance.



#### Admin Tip

This tip advises the administrator of a smarter, more productive or alternative method of performing an administrator-level task or procedure.



#### Settings

The Settings icon highlights information to help you zero in on settings you need to choose for a specific behavior, to enable a specific feature, or access customization options.

### Typography

A few typographic conventions, listed next, are used in this guide to distinguish types of in-text information.

Convention	Description
<b>Bold</b>	Highlights interface items such as menus, soft keys, file names, and directories. Also used to represent menu selections and text entry to the handset.

<i>Convention</i>	<i>Description</i>
<i>Italics</i>	Used to emphasize text, to show example values or inputs, and to show titles of reference documents available from the Spectralink Support Web site and other reference sites.
<u>Underlined blue</u>	Used for URL links to external Web pages or documents. If you click on text in this style, you will be linked to an external document or Web page.
Bright orange text	Used for cross references to other sections within this document. If you click on text in this style, you will be taken to another part of this document.
Fixed-width-font	Used for code fragments and parameter names.

This guide also uses a few writing conventions to distinguish conditional information.

<i>Convention</i>	<i>Description</i>
<MACaddress>	Indicates that you must enter information specific to your installation, handset, or network. For example, when you see <MACaddress>, enter your handset's 12-digit MAC address. If you see <installed-directory>, enter the path to your installation directory.
>	Indicates that you need to select an item from a menu. For example, <b>Settings &gt; Basic</b> indicates that you need to select <b>Basic</b> from the <b>Settings</b> menu.



# Chapter 1: Understanding Barcode Technology

Barcode technology enables you to encode and decode information stored in a variety of visual patterns. Barcode patterns can store a variety of data. Currently, PIVOT 8753 smartphone supports a wide range of one-dimensional (1D) and stacked 1D barcode types, including the Code 128 barcode symbology, which can contain up to 70 numerals and/or characters. PIVOT 8753 smartphone also supports a wide range of two-dimensional (2D) barcode types. Two-dimensional barcode symbologies typically encode more data, which may be contained in a smaller barcode label, as compared with 1D barcode symbologies. PIVOT 8753 can decode both 1D and 2D barcode label formats. PIVOT 8753 can also decode composite barcodes that contain both a 1D and a 2D barcode component, such as symbologies often found on drug packaging.

## 1D vs. 2D Formats

### PIVOT 8753 and 1D Barcode Patterns

Barcode patterns can store a variety of data. Currently, your Spectralink PIVOT 8753 smartphone supports a wide range of one-dimensional (1D) and stacked ID barcode types, including the Code 128 barcode symbology, which can contain up to 70 numerals and/or characters.

#### 1D examples



### PIVOT 8753 and 2D Barcode Patterns

Your Spectralink PIVOT 8753 smartphone supports a wide range of two-dimensional (2D) barcode types. Two-dimensional barcode symbologies typically encode more data, which may be contained in a smaller barcode label, as compared with 1D barcode symbologies. PIVOT 8753 can decode both 1D and 2D barcode label formats, as well as composite 1D/2D barcodes.

2D examples



QR



Aztec



Data Matrix

# Chapter 2: Barcode Applications

Barcode information is typically entered into a field in an application that processes the data. This application might be running:

- in the web browser on the smartphone
- on a computer that is linked to a PIVOT 8753 smartphone via QBC.

Information about how to use the PIVOT 8753 smartphone as a barcode scanner is contained in the *PIVOT by Spectralink User Guide*.

## Using On-board Applications

You can enter information into a web application running on the web browser on the smartphone. The scanned information is used by the web application and either populates an input field on the page or is used by code in the web page to continue a work flow.

## Using the Quick Barcode Connector (QBC)

You can enter information into an application that is running on a computer accessible to the user that has been loaded with the Quick Barcode Connector™ application.

QBC enables you to capture barcode data using a PIVOT 8753 smartphone and transfer the data to the application running on the computer associated with the scanning smartphone. You can think of it as a wireless barcode scanner connected to the computer. For more information, see the *Quick Barcode Connector (QBC) Administration Guide*.

## Supported Symbologies

All of the symbologies listed here are enabled by default.

Symbology
Aztec
Codabar
Code11
Code 39
Code 93
Code 128 GS1-128
DataMatrix

## Symbology

EAN / UPC  
UPC-A  
UPC-E  
EAN-8  
EAN-13

GS1 Composite

GS1 DataBar  
Omni-directional  
Limited  
Expanded

Interleaved 2 of 5

Matrix 2 of 5

Micro PDF 417

MSI Code

PDF 417

Plessey Code

QR Code

Standard 2 of 5

Telepen



### **Note: Symbologies available by default on 8453 and 8753 handsets**

All symbologies covered in this document are supported on both the 84- and 87-Series handsets. The 8453 model can be additionally configured through the .cfg files. The 8753 model is not further configurable for barcode symbologies and therefore only the default settings as outlined below are deployed as of this writing.

# Chapter 3: Barcode Parameters

Symbologies use the settings as described below.

## *Symbology Parameters*

### **Aztec**

- Aztec is a two-dimensional matrix style symbology which can encode around 3000 character using entire 256-byte ASCII character sets.
- The Aztec structured append header is not used. ECI is used.
- GS1-128 Emulation is not enabled.

### **Codabar**

- Codabar is a self-checking, discrete numerical symbology. It has a 16 character set and is used in blood banks, libraries and certain express parcel applications.
- Check digit not transmitted.
- The CLSI library system is not active.
- Codabar concatenation is not active.
- Minimum length for Codabar is 2 characters.

### **Code 11**

- Code 11 is a very high density, discrete numeric symbology. It is most extensively used in labeling telecommunications components and equipment.
- Check digit is transmitted.
- 1 digit check digit verification.

### **Code 39**

- The character set is uppercase A to Z, 0 to 9, dollar sign (\$), period (.), slash (/), percent (%), space ( ), plus (+), and minus (-). Standard Code 39 supports 43 characters while Code 39 Full ASCII (or Extended Code 39) supports 128 characters.
- The Code 39 accepted start character is \* only.
- Check digit is transmitted but not verified
- The Code 39 format type is the standard 43 characters.
- The Code 39 reading tolerance is high.

- Code 39 start/stop transmission is transmitted.

## Code 93

- Code 93 is an alphanumeric full ASCII symbology using combinations of 2 characters. Unlike Code 39, Code 93 is a continuous symbology which produces denser code. Code 93i encompasses and extends Code 93: alphanumeric, full and extended ASCII, and all Unicode characters.
- Minimum length for Code 93 is 1 character.

## Code 128



### Caution

ISBT 128 and Code 128 cannot be enabled at the same time. ISBT 128 is disabled by default and not currently available on the 8753 smartphone.

- The enabled symbologies are Code 128 and GS1-128.
- Code 128 is a very high-density alphanumeric symbology that supports the extended ASCII character set. It is a variable length, continuous code that uses multiple element widths.
- GS1-128 is a form of Code 128. It uses the normal Code 128 and adds the FNC1 character in the first position.
- The GS1-128 identifier is not included. According the GS1-128 norm, the AIM identifier "]C1" is added by default in front of each GS1-128 bar code as follows: ]C1<data>
- The FNC1 separator character is "1d". This separator is used when multiple identifiers and their fields are concatenated. For example, this is useful for separating fields when the <GS> character cannot be transmitted. The value is specified in hexadecimal.
- Minimum length for Code 128/GS1-128 is 1 character.
- The symbology 128 extended reading range is disabled
- The symbology 128 reading tolerance is high.
- Codes are always transmitted as single codes (no concatenation).
- Permits authorized ISBT 128 code pairs only.
- GTIN processing for GS1-128 is not enabled.
- Unconventional GS1-128 barcodes may not be decoded.

## Data Matrix

- Data Matrix is a two-dimensional matrix symbology.

## EAN / UPC

- Universal Product Code (UPC) symbology is the most commonly used bar code on consumer products in the USA and Canada. It is a fixed-length, numeric, continuous symbology that uses four element widths.
  - The UPC-A, UPC-E, EAN8 and EAN13 symbology variants are enabled.
  - UPC-E is a compressed version of UPC-A. It cuts the data length in half by compressing the extra zeros. As it is more compact than UPC-A, it is especially used on products with very small packaging where UPC-A bar codes would not normally fit.
  - EAN-8 is a compressed version of EAN-13 (as UPC-A and UPC-E). As it is more compact than EAN-13, it is especially used on products with very small packaging where EAN-13 bar codes would not normally fit.
  - The European Article Numbering (EAN) symbology is an extension of the UPC-A symbology which includes the country information. This symbology is used on most consumer goods in Europe.
  - Add-on digits not required but transmitted if read
  - The add-on digit security level is set to 10% to balance accuracy and speed of decoding.
  - Check digit transmitted for all variants: UPCA, UPCE, EAN-8 and EAN-13
  - Number system transmission for UPC-A is enabled. UPC-A has a transmitted number system equal to 0. The number system is transmitted as follows:  
<leading character> <number system> <data> <check digit>
- Number system transmission for UPC-E is enabled. The number system is transmitted as follows: <leading character> <number system> <data> <check digit>
- EAN-13 conversion to ISBN enabled. (Converts all EAN-13 bar codes beginning with "978" or "979" (except for "9790") by removing the first 3 digits, calculating the checksum on the remaining characters, and adding the ISBN (International Standard Book Number) check digit.)
  - GTIN processing for all UPC/EAN symbologies is not enabled. GTIN stands for "Global Trade Item Number" and transmits UPC/EAN symbologies as the 14 character EAN. UCC GTIN.
  - The reading range is set to extended to facilitate acquiring barcodes at a longer distance.

## GS1 Composite

- The GS1 Composite symbology consists of a linear component and an adjacent 2-D composite component. GS1 Composite CC-A, CC-B, CC-C and their combined modes are enabled.
- Reading of unconventional GS1 Composite codes is enabled
- GS1-128 emulation is disabled

- The barcode reader will automatically determine if the barcode is composite or not

## GS1 DataBar

- GS1 DataBar is a high density 1D bar code designed to encode standard GS1 Composite/EAN item numbers - up to 14 digits - in a very small footprint.
- GS1 DataBar Expanded encodes a GS1 Composite item identification plus supplementary element strings such as weight and "best before" date in a linear symbol that can be scanned omni-directionally by suitably programmed point-of-sale scanners.
- GS1 DataBar Expanded reads the following types of GS1 DataBar:
  - GS1 DataBar Expanded
  - GS1 DataBar Expanded Stacked
- The GS1 DataBar limited symbology is enabled.
- GS1 DataBar is a high density 1D bar code designed to encode standard GS1 Composite/EAN item numbers - up to 14 digits - in a very small footprint.
- GS1 DataBar Limited encodes a 14-digit GS1 Composite item identification with indicator digits 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 Limited does not read stacked version.
- The GS1 DataBar omni-directional symbology is enabled. GS1 DataBar is a high density 1D bar code designed to encode standard GS1 Composite/EAN item numbers - up to 14 digits - in a very small footprint.
- GS1 DataBar Omni-Directional encodes the full 14 digit GS1 Composite item identification in a linear symbol that can be scanned in any direction.
- GS1 DataBar Omni-Directional reads the following types of GS1 DataBar:
  - GS1 DataBar Omni-Directional
  - GS1 DataBar Truncated
  - GS1 DataBar Stacked
  - GS1 DataBar Stacked Omni-Directional

## Interleaved 2 of 5

- The Interleaved 2 of 5 symbology is enabled. Interleaved 2 of 5 is a higher-density numerical symbology based upon the Standard 2 of 5 symbology. It is used primarily in the distribution and warehouse industry. Unlike Standard 2 of 5, which only encodes information in the width of the bars, Interleaved 2 of 5 encodes data in the width of both the bars and spaces.
- Check digit not transmitted.
- Minimum length for Interleaved 2 of 5 is 4 characters.



- The Interleaved 2 of 5 symbology reading range normal.
- The Interleaved 2 of 5 symbology reading tolerance is high.

## Micro PDF 417

(2D only)

- Micro PDF417 is closely based on PDF417 but is more space efficient. It is used for applications that do not require the full data capacity of PDF417.
- Micro PDF417 Code 128 Emulation is disabled.

## MSI Code

- MSI Code is a bar code symbology and a modified version of Plessey Code. This code is fixed, continuous, and non-self-checking. It is often used to mark retail shelves for inventory reordering. The character set is 0 - 9 plus additional symbols.
- Check digit transmitted.
- Modulo 10 is used for check digit verification.
- Minimum length is 6 characters.

## PDF 417

(2D only)

- Macro PDF417, a feature of PDF417, extends the capability of PDF417 by allowing up to 99,999 PDF417 symbols to be used to store data. This requires the use of more than one PDF417 bar code.
- The PDF417 addressee is not transmitted.
- The PDF417 checksum is not transmitted.
- The PDF417 filename is not transmitted.
- The PDF417 file size is not transmitted.
- The PDF417 segment count is not transmitted.
- The PDF417 sender is not transmitted.
- The PDF417 time stamp is not transmitted.

## Plessey Code

- Plessey Code is a variable length, numerical symbology based on a four-bit binary number scheme. This pulse-width modulated bar code is commonly used for shelf marking in grocery stores.
- Check digit not transmitted.

- Minimum length for Plessey Code is 3 characters.

## QR Code

(2D only)

- QR Code is a matrix symbology consisting of a square array of modules with a finder pattern located at three corners. A wide range of symbol sizes is supported along with four levels of error correction, and the symbology is noted for its high data density.

## Standard 2 of 5

- Standard 2 of 5 is a low-density numerical symbology encoding all information in the width of the bars. This symbology is also referred to as "Straight 2 of 5" and "Industrial 2 of 5".
- Check digit is not checked or transmitted.
- The Standard 2 of 5 format uses identicon (6 start/stop bars).
- The minimum length for Standard 2 of 5 is 3 characters.

## Telepen

- Telepen is an alphanumeric full ASCII symbology with a defined letter case. It supports both ASCII and numeric formats.
- Telepen supports the ASCII format.
- Minimum length for MSI Code is 3 characters.

# Appendix A: Open Source Information

## *OFFER for Source for GPL and LGPL Software*

You may have received a Spectralink PIVOT smartphone from Spectralink that contains—in part—free software (software licensed in a way that allows you the freedom to run, copy, distribute, change, and improve the software).

A complete list of all open source software included in the Spectralink PIVOT smartphone, as well as related license and copyright information, is available at <http://support.spectralink.com>.

You may also obtain the same information by contacting Spectralink by regular mail or email at the addresses listed at the bottom of this notice.

For at least three (3) years from the date of distribution of the applicable product or software, we will give to anyone who contacts us at the contact information provided below, for a charge of no more than our cost of physically distributing, the items listed in “Spectralink OFFER of Source for GPL and LGPL Software”, which is available at <http://support.spectralink.com>.

### **Contact Information for Requesting Source Code**

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