Monterey Barcode Creator 4 User Manual

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Publication date: July 2021
Revision: 11562

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Chapter 1. Introduction

Monterey Barcode Creator is an easy-to-use program that lets anyone draw and print barcode labels. You do not have to know barcode terms in order to create quality barcodes.

The software comes with the following feature hightlights:

- The program supports most linear barcode formats, including *Code 39*, *UPC-A*, *UPC-E*, *EAN-13*, *EAN-8*, *Code 93*, *Code128*, *UCC/EAN-128*, *Codabar*, *POSTNET*, *Royal Mail*, *HIBC* and *Interleaved 2 of 5*.
- The program exports the barcode images to a variety of graphics formats, including *BMP*, *JPEG*, *GIF*, *PNG*, *TIF*, *WMF* and *EMF*.
- The program provides more than two dozen properties that allow users to get the barcode they desired.
- The program does not only create barcode images; it also creates human readable and comment. In addition, it allows flexible placement of these elements.
- The program has a built-in label database with more than 1,500 widely used label paper templates.
- The program now supports batch printing from a number sequence or a data file.
- The program can act as an OLE server to embed itself into a Microsoft Office document. This method produces better quality barcodes than pasting a metafile or bitmap image.

1.1. How to Read this manual

If you never have experience with barcode label, we recommend that you read from Chapter 2, *Get Started* to get an idea how this program works. You might want to follow the tutorial to create your first barcode.

Chapter 5, *Printing Barcodes* outlines the necessary steps to print barcodes out to a printer. This chapter should be read thoroughly, especially if you plan to use the batch printing feature.

If your emphasis is on integrating barcodes into Microsoft Office documents, read Chapter 6, *Using Barcode Creator in MS Word, Excel and other programs*.

At last, read Chapter 7, *Barcode Properties Reference*. You may need to go back there to lookup some parameters from time to time.

If you are not familiar with the barcode format you are working with, Chapter 8, *Barcode Technologies* will give you a brief idea about all the symbologies this program supports.

Chapter 2. Get Started

2.1. System Requirements

Monterey Barcode Creator requires the following systems:

1. Microsoft Windows® 7, Windows Server 2008 or above.
2. Pentium processor or above.
3. 512 megabytes of RAM.
4. 100 megabytes of free hard drive space for installation.
5. A thermal/Ink Jet/Laser printer with resolution at least 200 dpi. A laser printer with 600-dpi or above is highly recommended.
6. A barcode scanner to verify the barcode created.

2.2. Installing Monterey Barcode Creator

2.2.1. To Install Barcode Creator from a CD

1. Insert the program CD into your CD drive. The setup starts automatically. Or if the auto-run feature isn't enabled on your system, click the Windows Start button and choose the Run command. Type **`D:\Setup.exe`** in the dialog box and click the OK button (Note that `D` represents the letter assigned to your CD-ROM drive. If your drive is assigned to a different letter, use it instead of `D`).
2. Follow the on-screen instructions.
3. Your will be prompted to enter the `License To`/ `Registration Code`. The `License to`/ and `Registration Code` information are found on the back of the CD case.

2.2.2. To Install Barcode Creator from direct download

1. Click the Download link to start the download.
2. When the browser prompts, do one of the following: A. To run setup immediately, click Open or Run This Program from Its Current Location. B. If you decide to run the setup at a later time, click `Save` or `Save This Program to Disk`.
3. If you choosed `Save This Program to Disk` in Step 2, locate the file where you saved it, and double click the .exe file to run setup.
4. Follow the setup instructions.
5. Your will be prompted to enter the `License To`/ `Registration Code`. The `License To`/ and `Registration Code` information can be found in the email we send to you after order completes.

2.3. Running Monterey Barcode Creator

To run Barcode Creator, follow the basic operations:

1. Choose Programs from the Start menu.
2. Choose the Morovia folder.

3. Choose Barcode Creator folder.
4. Choose the Barcode Creator 3.

The program can also be launched by double clicking the shortcut installed on the desktop.

2.4. The Workplace

2.4.1. Menu

Many program features of Monterey Barcode Creator, including the software menus, resemble to Microsoft Office applications. They are easy to use.

A menu displays a list of commands. To select a command from the menus, you can do the following:

1. Click the left mouse button once directly on the menu name (i.e., File, Edit, View, etc.).
2. When the menu drops down, click once on the desired command.

2.4.2. Toolbar

The toolbar buttons give you quick access to many frequently used commands and features in the Monterey Barcode Creator.

To find out the name of a tool, hold the mouse pointer motionless over the tool button for about a second and a ScreenTip will appear showing the name of the tool.

The status bar at the bottom of the Barcode Creator application window also provides a brief description of the tool, over which the mouse is positioned on.

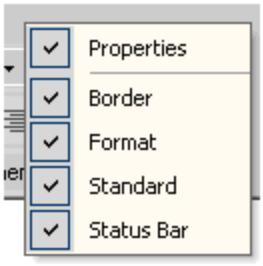
To select a command using the toolbar, you may do the following:

1. Position the mouse over the desired tool button.
2. Click the left mouse button once.

2.4.2.1. Customizing Toolbars

You can rearrange or modify the toolbars, so that it is personalized for the way you work.

To show or hide a toolbar, on the drop-down View menu, point to toolbars, and then check the toolbars that you want to show or hide. Alternatively you may right click on the spare space of the toolbuttons, then on the pop-up menu check or uncheck the toolbars you want to show or hide.



The toolbars can also be moved anywhere on the screen by docking and floating.

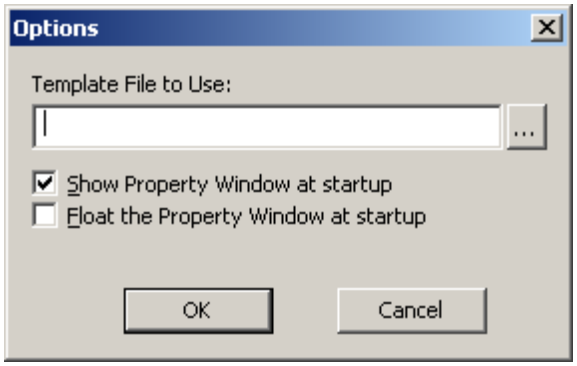
To float and dock the toolbar, follow the steps below:

1. Double-click on the toolbar. Note that you must double-click on an area of the toolbar between or below the toolbar buttons. The tools will now appear in a floating window.

2. Click and drag the toolbar to the desired location. If you want the toolbar docked on the screen's edge, drag the toolbar until the cursor appears over the edge. The cursor will change shape to indicate that the toolbar can be docked.
3. To return a floating toolbar to its docked location, simply double click the title bar on the floating toolbar's window.

2.4.3. Dialog

After you choose a command, a dialog often appears. A dialog is used to select options pertaining to the command or feature. If an option in a dialog is dimmed, this means the option is not available. Some dialogs provide various sets of options. These sets of options are divided into tabbed pages. Click on the tab to display the options.



2.4.4. Properties Window

Monterey Barcode Creator 3 introduces a new window, which allows you to fine tune the barcode you created.

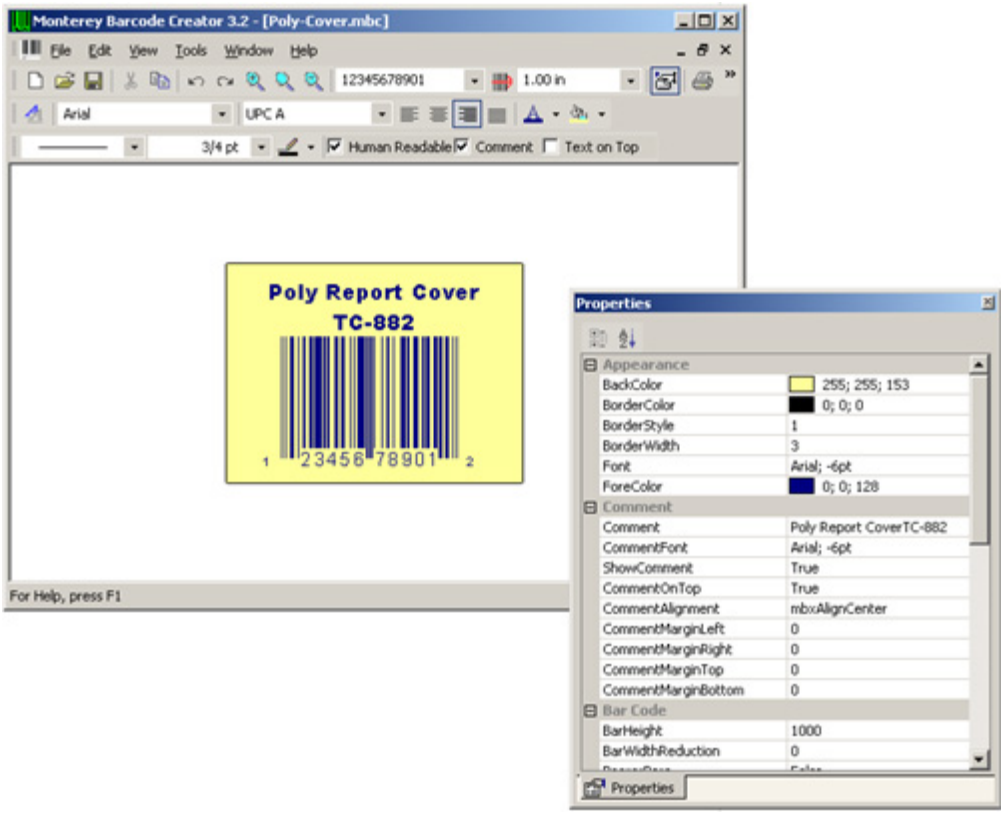
Use this window to view and change the design-time properties of the barcode object located in the designer window. Properties window is available from the View menu.

The Properties window displays different types of editing fields, depending on the needs of a particular property. These edit fields include edit boxes, drop-down lists, and links to custom editor dialog boxes. Properties shown in gray are read-only.

Element	Graphic	Description
Categorized		Lists all properties and property values for the selected object, by category. You can collapse a category to reduce the number of visible properties. When you expand or collapse a category, you see a plus (+) or minus (-) to the left of the category name.

Element	Graphic	Description
Alphabetic		Alphabetically sorts all properties and events for selected objects. To edit an undimmed property, click in the cell to its right and enter changes.
Properties		Toggle on/off the display of the Properties window

Like toolbars, the Properties window can also be docked or floated.

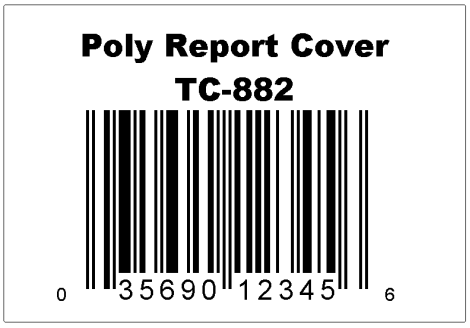


2.5. A Quick Tour

Welcome to Monterey Barcode Creator, the powerful barcode image creation program. This quick tour is designed to introduce you to the power and flexibility of the Monterey Barcode Creator. Monterey Barcode Creator performs several key functions: creating, opening and printing barcodes. This short tour will show you each of these functions.

After completing this tour, you should be able to perform all the tasks necessary to manage your barcodes. The remainder of the manual is a reference for additional information about specific features.

In this tour we are going to make barcodes for our fictional product - Poly Report Cover. We'd like to print the labels on a 2 X 7 Avery® label paper. Each label contains a UPC-A barcode with the bar height at 1.0 inch, 13 mils in X dimension. On the top of the barcode, we'd like to place the text `Poly Report Cover TC-882`. A completed label will be the one like below:



2.5.1. Creating Barcode

First, we are going to create a barcode. Start the Monterey Barcode Creator by clicking Start | Programs | Morovia | Barcode Creator. The program displays a default barcode with `Morovia` encoded as a Code 39 barcode.

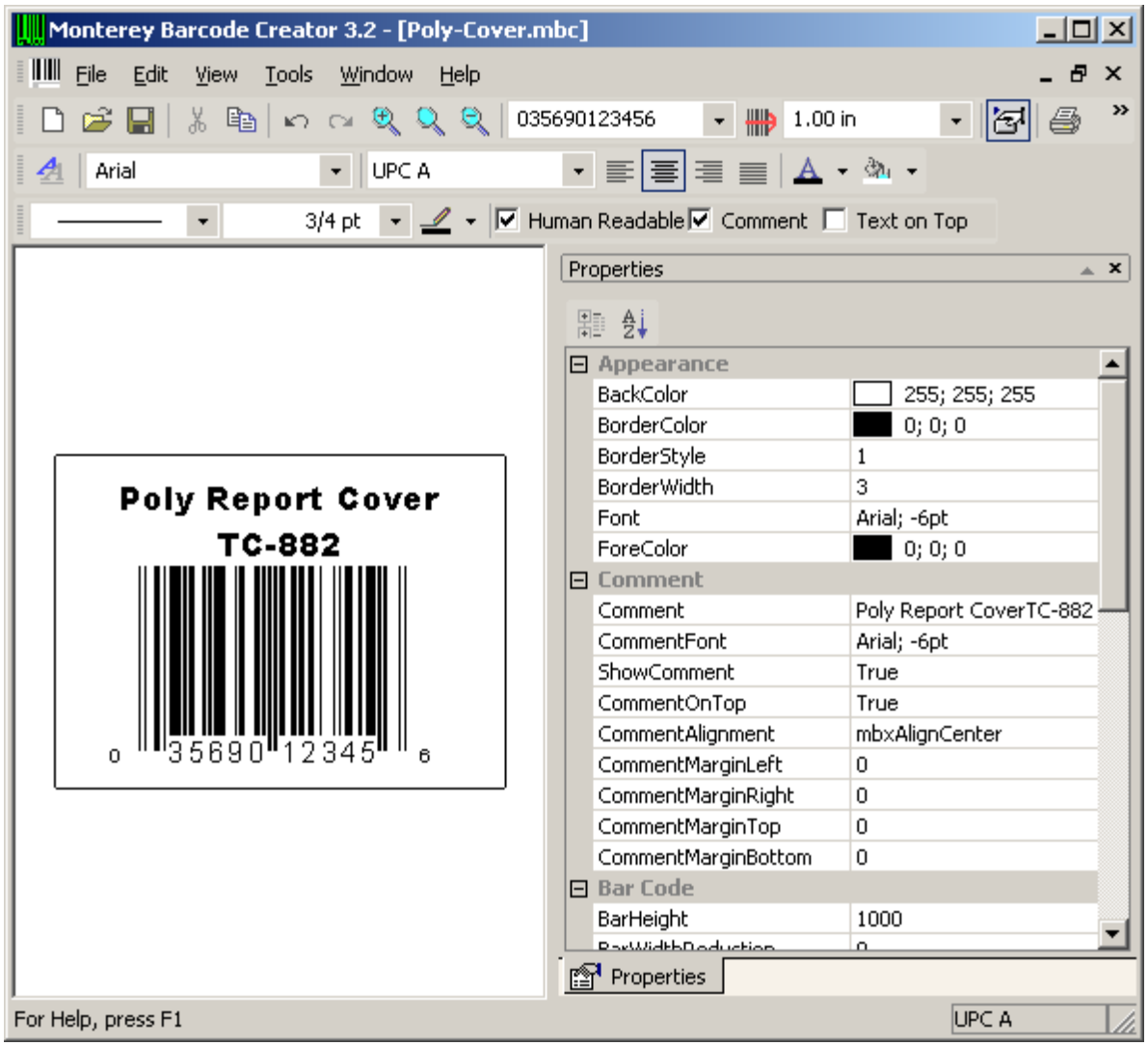
From the Symbology combo box in the Format toolbar, change the current symbology to UPC-A. The program displays the default UPC-A barcode.

From the Message combo box in the Standard toolbox, type our sample number **`03569012345`**, total 11 digits. You do not need to enter the last checksum digit. If you do, the program ignores it. Press Enter or click the Redraw button  , which is on the right to the combo box.

The default barcode image does not have surrounding borders. To add the borders, select `solid line` from the Border Style combo box located on the Border toolbar, and set the border width to 3/4 pt.

2.5.2. Changing Comment

The next step is to change the comment and place it on top. To do this, we need to open the Properties window. Select View | Properties or click on the Properties button on the Standard toolbar.



Click on the Comment edit box, select all the text and press **Delete**. Type **`Poly Report Cover\nTC-882`**. The characters `\n` forces a line return at the middle of the text. Press **Enter** to apply the change.

Click on the ShowComment edit box and select `True` from the drop-down menu to show comment.

Click on the CommentOnTop box and select `True` to place the comment on top of the barcode.

Click on the CommentFont line. A small button appears at the right of the box. Click the button to pop up the Font dialog. Change the typeface to `Arial Black`, set font style to regular and font size to 9 pt. If your computer does not have the `Arial Black` typeface, use `Arial` instead.

Click OK to close the dialog box.

Click on the CommentAlignment box and select `mbxAlignCenter` to place the comment in center.

Click on the BarHeight box and enter 1000. All length units in Barcode Creator are in mils (1/1000th inch); so 1000 translates to 1.0 inch, which is what we wanted.

You can also enter the bar height through the BarHeight combo box appearing on the Standard toolbar. In the combo box you can use text form of the length, such as **`1.0 inch`**.

Navigate to the NarrowBarWidth and enter **`13`**. As indicated above, 13 means 13 mils or 0.013 inch.

2.5.3. Adjusting Symbol Margins

We want to leave enough spaces between the barcode and the borders. This can be done by adjusting comment margin properties. Scroll down the Properties window and locate four symbol margin properties: `CommentMarginTop`, `CommentMarginBottom`, `CommentMarginLeft` and `CommentMarginRight`. Assign 100 to `CommentMarginTop` and `CommentMarginBottom`. Assign 300 to `CommentMarginLeft` and `CommentMarginRight`. All length units used in Barcode Creator are in mils (1/1000th inch). So 300 translates into 0.3 inch.

2.5.4. Saving the File

To save the file, press **Ctrl+S** or select Save from the File menu. Type the file name you would like to use and click OK.

2.5.5. Printing Barcode Labels

After we finished the barcode design, now we can print them out. Our goal is simple: print a full sheet of barcode labels on Avery 8463 label paper. To do this, we first load the label paper in our printer. If you do not have such a label paper, simply load the standard letter or A4 paper.

Select Print from the File menu, or press the Print button on the Standard toolbar. The Print dialog pops up.

Check `Use Label Settings` box. The dialog expands to display the label paper properties.

In the `Label Products` combo box, select `Avery Standard`. In the `Product Number` box, scroll all the way down and select `8463 - Shipping`.

In the `Print Range` box, make sure that `Full Page of the Same Label` option is selected.

You can have the program remember the label settings by clicking the Save button. Next time, the program loads the label settings automatically.

Click on the Print button to print a full sheet of barcode labels.

Started from version 3.3, Barcode Creator supports some advanced features such as batch printing. For more information, refer to Chapter 5, *Printing Barcodes*.

2.5.6. Making the default template

If you want to re-use the properties of this barcode file (such as comment text and margins), you can make the file as a template for your future new barcode files. After you make the file a template, all subsequent new barcodes copy the properties from this template file. If the template file is not present, the default barcode properties are used.

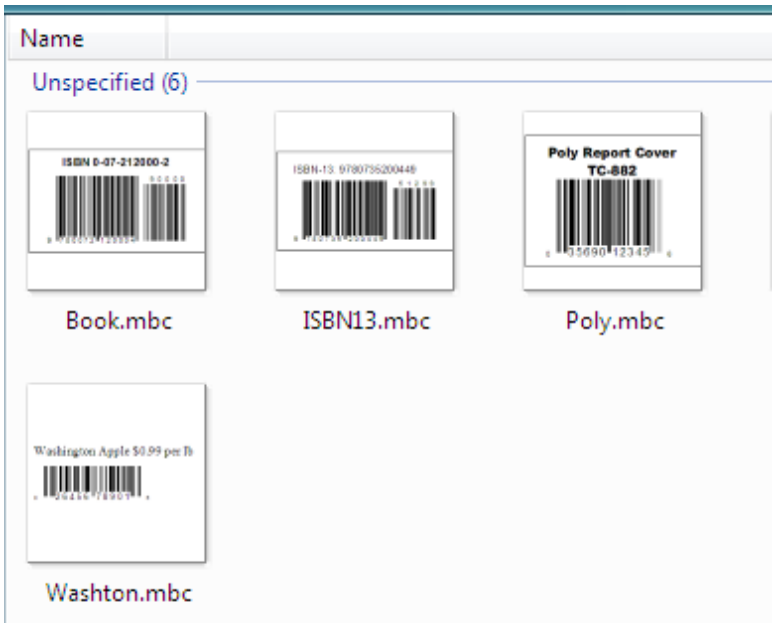
To make a file template, click on Tools | Options to pop up the Options dialog. Click the Browse button at the right of `Template File to Use` box and navigate to the barcode file we just created. Click OK twice to dismiss the dialogs.

Now select New from the File menu. The new barcode copies all the properties from the template file.

2.6. Thumbnail View in Windows Explorer

Thumbnail view shell extension is available since version 3.6 (released in July 2010). When thumbnail view is enabled in Windows Explorer, you can view the contents of the files in thumbnail in Windows Explorer, without opening Barcode Creator.

Figure 2.1. Thumbnail View in Windows Explorer



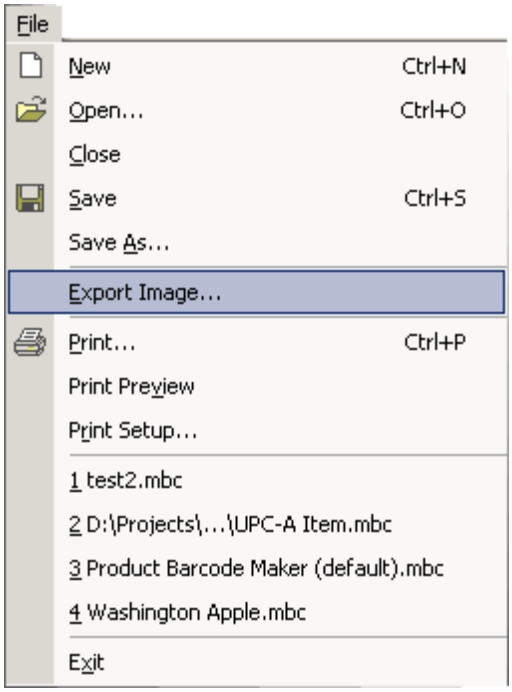
In version 4, 64-bit thumbnail view shell extension is added to package.

Chapter 3. Menu Commands

3.1. File Menu

The commands on the File menu allow you to create, save, close, print, export barcode files and exit Monterey Barcode Creator itself.

Figure 3.1. File Menu



- **New**

  A new barcode drawing is created by using the New command on the File menu. When a new barcode drawing is created and displayed on the screen, the default properties are copied from a template file. You can specify the template file from Tools | Options menu. If no template file is present, the default settings are used. The default barcode drawing bears Morovia logo and copyright.

- **Open...**

  A saved barcode file can be redisplayed by using the Open command on the File menu.

  A standard Windows File Open dialog pops up to allow you to explore the file system to locate the barcode file you want to open.

- **Save/Save As**

  When you open a barcode drawing, Monterey Barcode Creator loads the contents from the disk to the screen. Changes made to the barcode drawing are temporarily stored in memory until you save them to the disk.

  Barcode drawings are saved with Save or Save As command on the File menu.

If you use the Save command to save the barcode document and the selected barcode document is unnamed, the Save dialog will appear prompting you to provide a name. If you attempt to close the file to which you have made changes, you will be asked if you want to save the drawing. You can save the barcode file to any folder you want. In practice, we recommend you use a dedicated foler under My Documents folder and under the root disk drive.

We also recommend that you save your drawing often when making extensive changes, so that you avoid losing your work due to power outages or other unplanned events.

- **Export Image...**

  After you finish designing your barcode, you may desire to move the artwork to another program.

  Monterey Barcode Creator supports the following graphics format: BMP, JPEG, GIF, TIF, PNG and EMF. The EMF (enhanced metafile) is a vector graphics format and used internally by Windows. All others are raster graphics formats.

  If you export an image in a raster graphics format, such as JPEG, you need to be aware that raster image format does not hold all information, especially under a low resolution condition. A raster image can be though as a two-dimensional array of pixels, with each pixel containing the color information. Most of raster image formats do not have a field to specify the resolution information. As a result, you may need to specify the resolution when you export to another program.

  The property of RasterImageResolution determines the resolution used when exporting to a raster image format. The default value of this property is 300.

- **Print...**

  Monterey Barcode Creator has a built-in database with 1,500 known label paper products. Most likely the label paper you are using is already in the database; if it is not, you can always add it.

  Click the Use Label Settings... button to activate the label paper list. Select the paper you are working with and check the appropriate printing options. Otherwise the barcode is printed on the top left side of the paper.

- **Print Preview**

  To see how a barcode drawing will appear when printed, use the Print Preview command on the File menu or click the Print Preview button on the toolbar. Print Preview will show you an exact replica of the printed chart on your computer screen. The Print Preview command is also available directly from the Print dialog.

  The buttons along the top of the Print Preview window allow you to print and change the view of the chart.

- **Print Setup**

  To select the default printer, paper size, use this command.

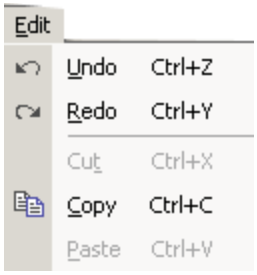
- **Recent Used Files**

  The four most recently opened or closed barcode files are displayed at the bottom of the File menu.

  To open one, you can either click it with the mouse, highlight it and press **ENTER**, or choose the number (with the File menu displayed) that corresponds to the one you want to open.

3.2. Edit Menu

Figure 3.2. Edit Menu



- **Copy**

  The copy command allows you to transfer the graphics to Windows clipboard. The format used is Enhanced Windows Metafile, a format which records the frame size. Most of Windows graphics programs support this format.

  Although Windows Metafile is a vector format, many programs rasterize the drawing using the screen resolution. It may cause printing problems. If this is the case, save the file as Bitmap at a high resolution (ex. 300 dpi) and import the file into the graphics program.

- **Undo**

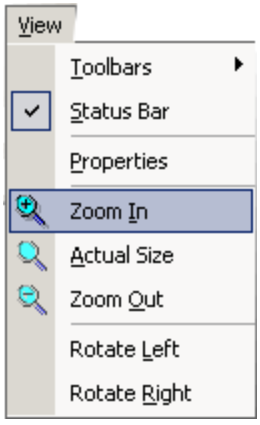
  The Undo command has the effect of undoing the last document property modification. If nothing can be undone, it displays in grey.

- **Redo**

  The Redo command reverses the last Undo operation.

3.3. View Menu

Figure 3.3. View Menu



The commands on the View menu toggle the Toolbars and Status Bar on and off.

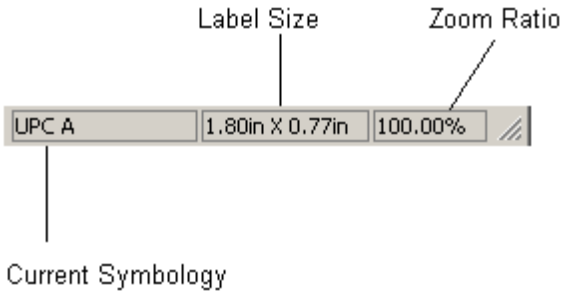
- **Toolbars**

  The toolbars are found below the menu bar ot the top of the screen. Each of the button on the toolbars represents a frequently used command in the Barcode Creator. See Chapter 1 for detailed information about using the toolbars.

  Monterey Barcode Creator V3.0 features three toolbars: Standard, Format and Border.

- **Status Bar**

  The Status Bar is at the bottom of the Barcode Creator application window. It provides a description of the currently selected menu command in the first pane. The next 3 panes on the right provide information about the current symbology, overall symbol size and the current zoom ratio.



  To display the Status Bar

  Choose the Status Bar from the View menu, so that a check mark appears.

  To hide the Status Bar

  Choose the Status Bar from the View menu, so that the check mark disappears.

  View the current symbology

  The current symbology information is found at the second pane of the Status bar.

  View the overall symbol size

  The symbol size is expressed in inch. It is located at the third pane of the Status bar.

  View the zoom ratio

  The zoom ratio information is located at the last pane of the Status bar.

- **Properties**

  This command toggles the display of the Properties Window.

  Monterey Barcode Creator 3 introduces a new window allowing you to fine control the barcode you created.

  Use this window to view and change the design-time properties of the barcode object located in the designer window. Properties window is available from the View menu.

  The Properties window displays different types of editing fields, depending on the needs of a particular property. These edit fields include edit boxes, drop-down lists, and links to custom editor dialog boxes. Properties shown in gray are read-only.

- **Zoom In / Zoom Out / Actual Size**

  The Zoom In and Zoom Out commands can be selected from the View menu or from the Standard toolbar. The Zoom Ratio is displayed in the Status bar.

  The Zoom In command progressively zooms in on barcode drawing displayed on the screen. Each time the command is used, the more detailed the view of the barcode drawing.

  The Zoom Out command changes the scaling to the previously zoomed state. For example, if you have used the Zoom In command to zoom in on the drawing four times, the Zoom Out command will take you back to the third zoomed view. Using it again will take you back to the second zoomed view, etc.

- **Rotate Left / Rotate Right**

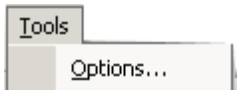
  The Rotate Left and Rotate Right commands are selected from the View menu.

The Rotate Left command rotates the barcode drawing anti-clockwise in an increase of 90 degrees.

The Rotate Right command rotates the barcode drawing clockwise in an increase of 90 degrees.

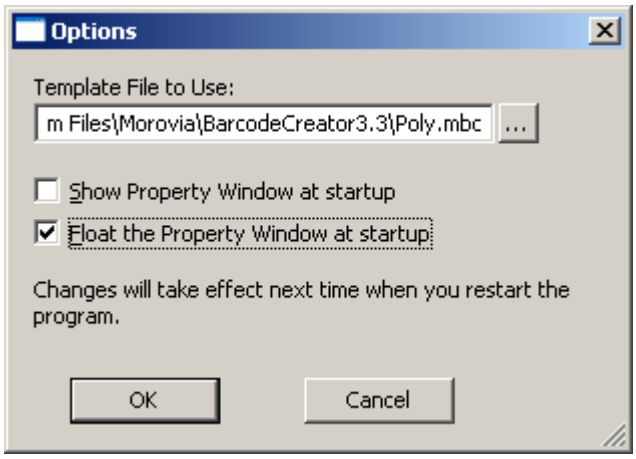
3.4. Tools Menu

Figure 3.4. Tools Menu



The Options... command on the Tools menu allows you to configure the template file. It also lets you display or hide the Properties window.

- **Options**



The Options dialog is used to configure the default template file to use when creating a new barcode. It also gives you options to configure the display attributes of the Properties window.

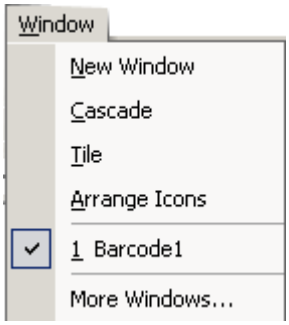
- **Template File to Use**. Specify the template to use when creating a new barcode. All the properties of the template barcode are copied to the new barcode. This allows you to create multiple barcodes based on a common property set.

  For example, you want to create 100 barcodes, each with a different number but all have the same comment and layout. You can create a barcode and save it into the disk. Then open the Options dialog and navigate to this file. After that all the new barcodes generated will have the same comment and layout.
- **Show Properties window at startup**. Select this option to display the Properties window at the startup. The Properties window is hidden by default.
- **Float Properties window at startup**. Select this option to make the Properties window float at the startup. Note that you must check the Show Properties window at startup too to display the Properties window.

3.5. Window Menu

The commands on the Window menu are used to control the layout of the drawings and icons in the Barcode Creator workspace. All commands are standard MDI (Multiple Document Interface) commands. For more information, visit http://msdn2.microsoft.com/en-us/library/ms644908.aspx.

Figure 3.5. Window Menu

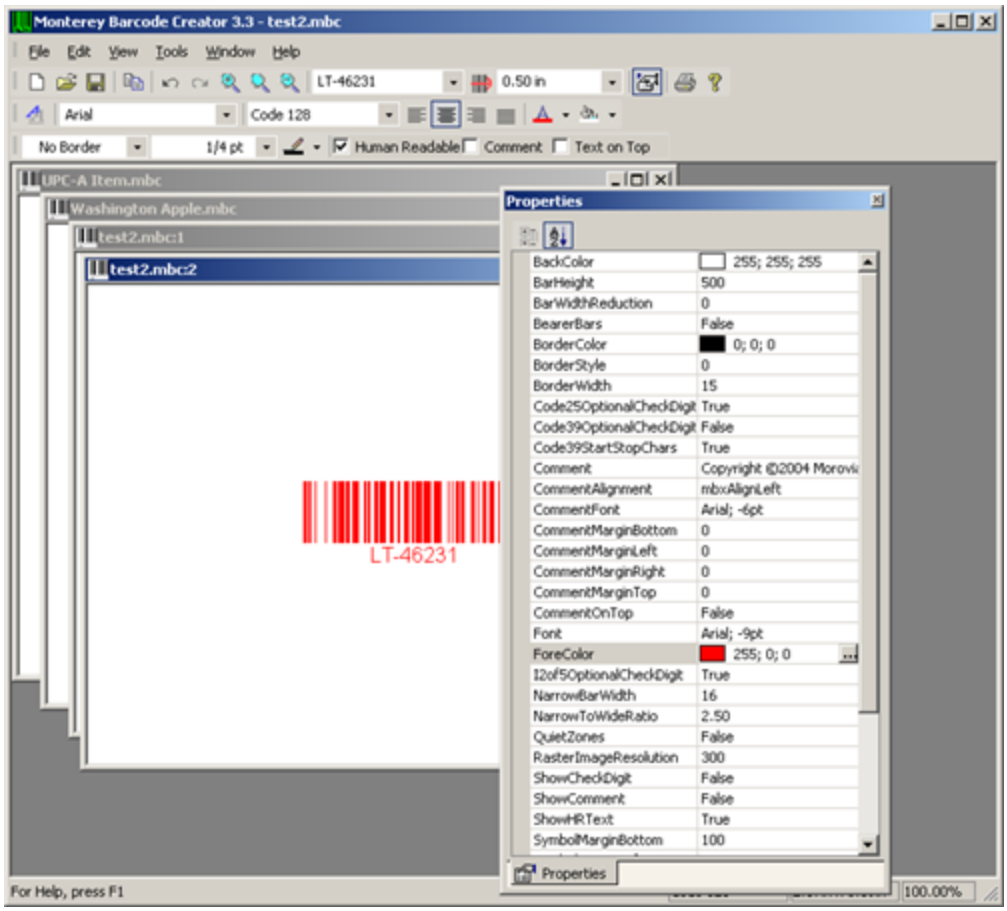


- **New Window**

  Use the New Window command to create a new window of the current document. This feature is useful when you want to have different views present. For example, you can have a window showing 100% zoom ration and another one at 400%.

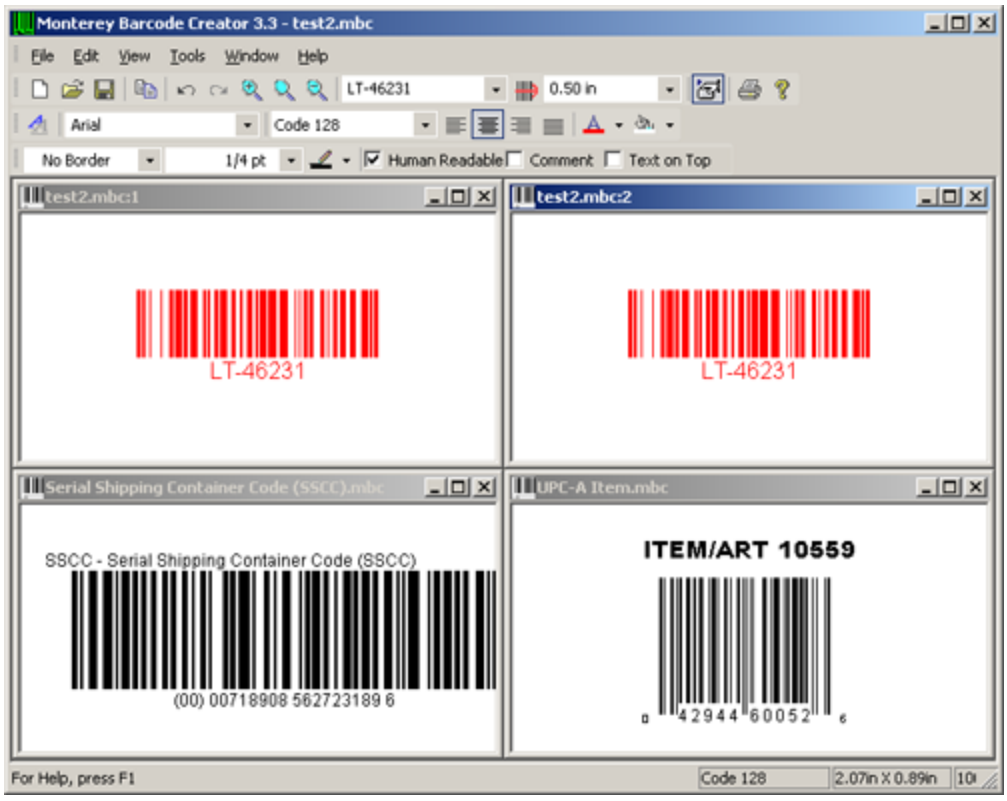
- **Cascade**

  Use the Cascade command to arrange all open windows in a cascade-like arrangment in the Barcode Creator workspace



- **Tile**

  Use the Tile command to arrange all open windows in a title like arrangement in the Barcode Creator workspace.



- **Arrange Icons**

  Use the Arrange Icons command to arrange all document icons at the bottom of the Barcode Creator workspace. A document is minimized by clicking on the minimize button on the top right corner of the window frame.

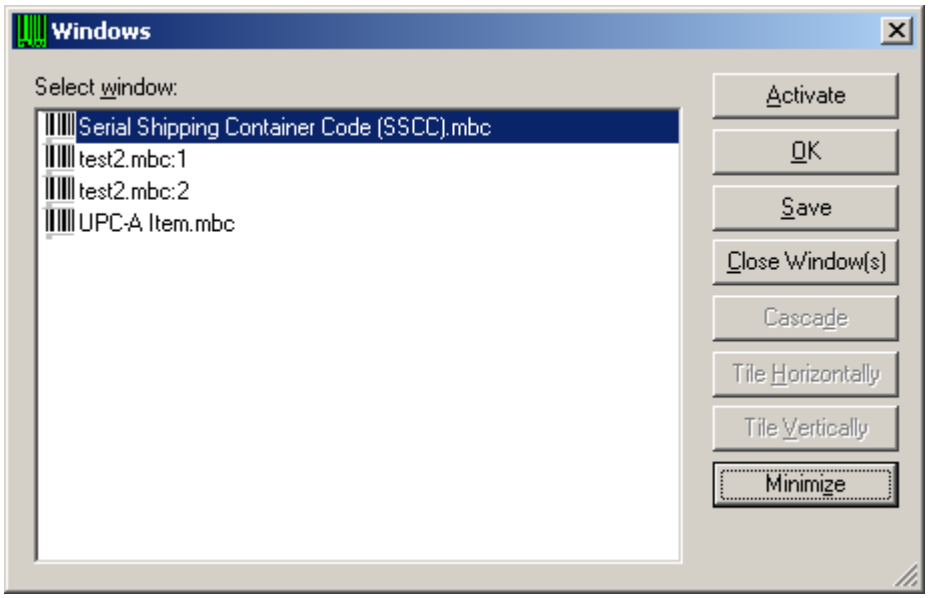
- **Document List**

  At the bottom of the Window menu, the names of each open document are listed. A check mark designates the currently selected document.

  To switch between documents using the Window menu, click on the name of desired document. You can also switch between documents by simply clicking directly on the desired document in the Barcode Creator workspace. The selected document has a unique heading background.

- **More Windows...**

  The last menu item is More Windows command, which pops up a dialog allowing you to activate, save, close or minimize any open window.

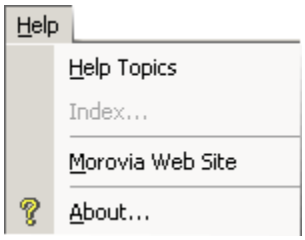


3.6. Help Menu

The quickest way to find out how a specific feature works in Barcode Creator is using the help system. The Barcode Creator's help system can be accessed by choosing Barcode Creator Help from Help menu.

The Monterey Barcode Creator User's Manual and the Help are based on the same material.

Figure 3.6. Window Menu



- **Help Topics**

  Use Help Topics command to view the online help. The help is in standard Microsoft HtmlHelp format. You can search by keywords, or read it topic by topic.
- **Morovia Web Site**

  Use this command to quickly access Morovia web site.
- **About...**

  The About command displays a window with information about your copy of the Monterey Barcode Creator, including the program version, build number, license to and registration code.

  If you are using a trial version of the Monterey Barcode Creator, a register button displays. Press this button to pop up the registration dialog, from which you can type the registration information to convert your trial copy to the retail version.

  Both `LicenseTo` and `Registration code` must match the ones appeared in the email we sent to you if you order online at Morovia WebStore[1] or our affiliate shopping sites. Both fields must match. The

registration information is written to the registry and checked every time you start the Monterey Barcode Creator.

Note Entering registrion information requires the current user having administrator privilege. If you are not a member of local administrators, you need to log on as an administrator to reigster the software.

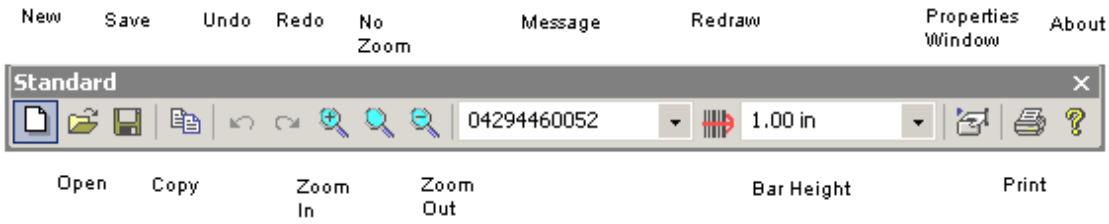
Chapter 4. Toolbars

Monterey Barcode Creator features three toolsbars: the Standard toolbar, the Format toolbar and the Border toolbar. A toolbar comprises various buttons and other controls, which allow you to quickly access a command.

4.1. Standard Toolbar

On the View | Toolbars menu, you can specify whether or not you want to display the Standard Toolbar. The Standard Toolbar includes following tool buttons.

Figure 4.1. Standard Toolbar

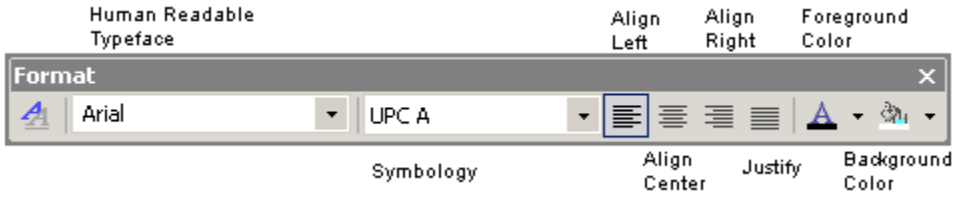


- **New**. Create a new barcode drawing. Same as File | New.
- **Open**. Open an existing barcode file. Same as File | Open.
- **Save**. Save the current drawing into a disk file. Same as File | Save.
- **Copy**. Copy the current drawing onto clipboard, so that it can be pasted into another program. Same as Edit | Copy.
- **Undo**. Undo the last action. Same as Edit | Undo.
- **Redo**. Revert the last Undo operation. Same as Edit | Redo.
- **Zoom In**. Scale up the current drawing. Same as View | Zoom In.
- **Actual Size**. Restore the scale ratio to reflect the actual size of the drawing. Same as View | Actual Size.
- **Zoom Out**. Scale down the current drawing. Same as View | Zoom out
- **Message**. Enter text into this combo box to change the Message property of the barcode object.
- **Redraw**. Redraw the current drawing.
- **BarHeight**. Through this combo box you can change the BarHeight property of the barcode. Monterey Barcode Creator allows some flexibility on the input, such as 0.5 in, 3cm etc.
- **Properties Window**. Use this button to toggle the display of Properties window.
- **Print**. Displays the Print dialog to print the barcode drawing. Same as File | Print.
- **About**. Displays the About dialog. Same as Help | About.

4.2. Format Toolbar

Format Toolbar provides commands to change the symbology, control the foreground and background colors of the image, as well as the typeface and alignment options of the human readable.

Figure 4.2. Format Toolbar



- **Human Readable Typeface**. This combo box allows you to quickly change the typeface used in the human readable. The font combo box provides a preview of each font.
- **Symbology**. The symbology combo box allows you to change the barcode format used. It displays the full list of symbologies supported by this program.
- **Alignment**. The next four buttons control how the human readable text is aligned. You can align the text to the left, to the right, to the center or justification the text.
- **ForeColor and BackColor**. Use the two buttons to select the forecolor and the backcolor of the image. Note: barcodes require decent contrast ratio in order to be read succesfully. Always test the results thoroughly when you select a color pair instead of black and white.

4.3. Border Toolbar

Border Toolbar provides commands to select border style, size and color. It also has three check boxes allowing you to toggle the display of the human readable text, comment; and contorl if the text is placed on the top of the barcode image.

Figure 4.3. Border Toolbar

- **Border Style**. The Border Style offers a list of border styles, including solid line, dot line, solid dot dot line and so on.
- **Border Width**. Defines the width of the border.
- **Border Color**. You can select the border color from the color picker dialog.
- **Human Readable**. Toggle the display of the human readable text.
- **Comment**. Toggle the display of the comment.
- **Text On Top**. If the check box is selected, the haman readable text is placed on the top of the barcode image; otherwise it is at the bottom. Not all symbologies honor this setting.

Chapter 5. Printing Barcodes

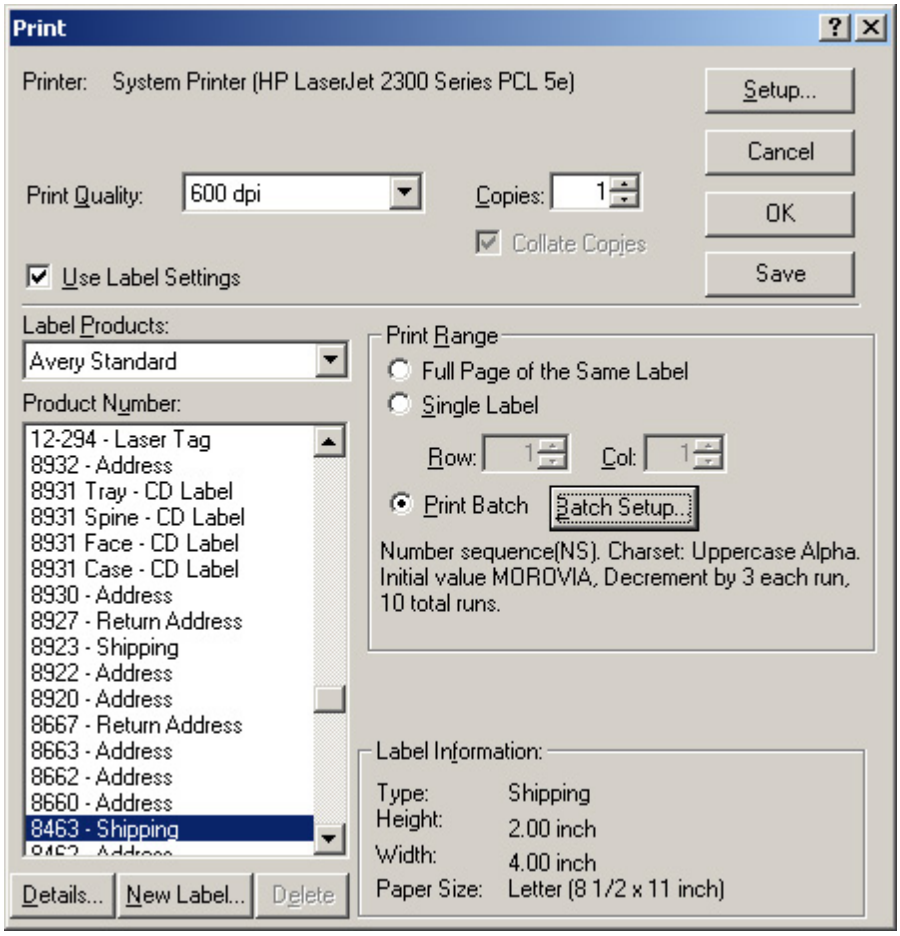
Montrey Barcode Creator allows flexible printing options. Having a built-in database with 1,500 label paper templates, it supports label printing. If you can not find the label paper you are using, you can always add your own. Started from version 3.3, Monterey Barcode Creator supports batch printing, which lets you specify a number sequence or a data file, from where the program pulls a series of data and print their barcode representations in one command.

All printing capabities are accessible from the Print dialog.

5.1. Print Dialog

The `Print` command under the File menu activates the Print dialog. You can use this dialog to control the print range, to batch print series of barcodes, to define you own label papers, or set other options.

Figure 5.1. Print Dialog



- **Printer**

  The current selected printer is shown at the top of the dialog. You can change to a different printer by clicking the Setup... button.

- **Print Quality**

  Displays the printer resolution. To change to a different resolution, use the drop down list (if the printer supports multiple resolutions).
- **Printing Multiple Copies**

  You can print more than one copy of your barcode image by entering the number of copies you want in the Copies field. The Collate Copies check box determines the order in which the copies of the drawing are printed.
- **Use Label Settings**

  Check this box if you want to print on label papers. Uncheck this box if you want to print to a plain paper. The dialog expands or collapses based on the status of this option. If you choose to use label settings, you will have to configure the settings.
- **Save**

  Save the current label settings as the default. The Print dialog will switch to the label you specified last time, and the print preview will use this label settings. If you frequently print to a specific label paper, select the label paper first and click Save.
- **Cancel**

  Click the Cancel button to cancel the print operation.
- **OK**

  Click the OK button to print the current barcode image.
- **Print Range**

  You can define two types of print ranges. Select the first option to print a full page of the same label. Select the second option to print a single label. For example, if you want to print the barcode on the second row and the third column of the label paper, select Single Label button, and type 2 in the Row edit box and type 3 in the Col edit box.
- **Label Products**

  This drop-down box displays the label paper vendors in database. Choose the one matches your paper, or use Other/Custom to add one which does not exist in the database.
- **Product Number**

  This field displays all products made by the selected label paper vendor. In the box on right side, the information about the current selected label product will be displayed.
- **Label Information**

  Displays the type, height, width and paper size of the label product you selected.
- **Details**

  Clicking this button pops up the Details dialog. It displays the product name, label width, label height, horizontal pitch and vertical pitch.

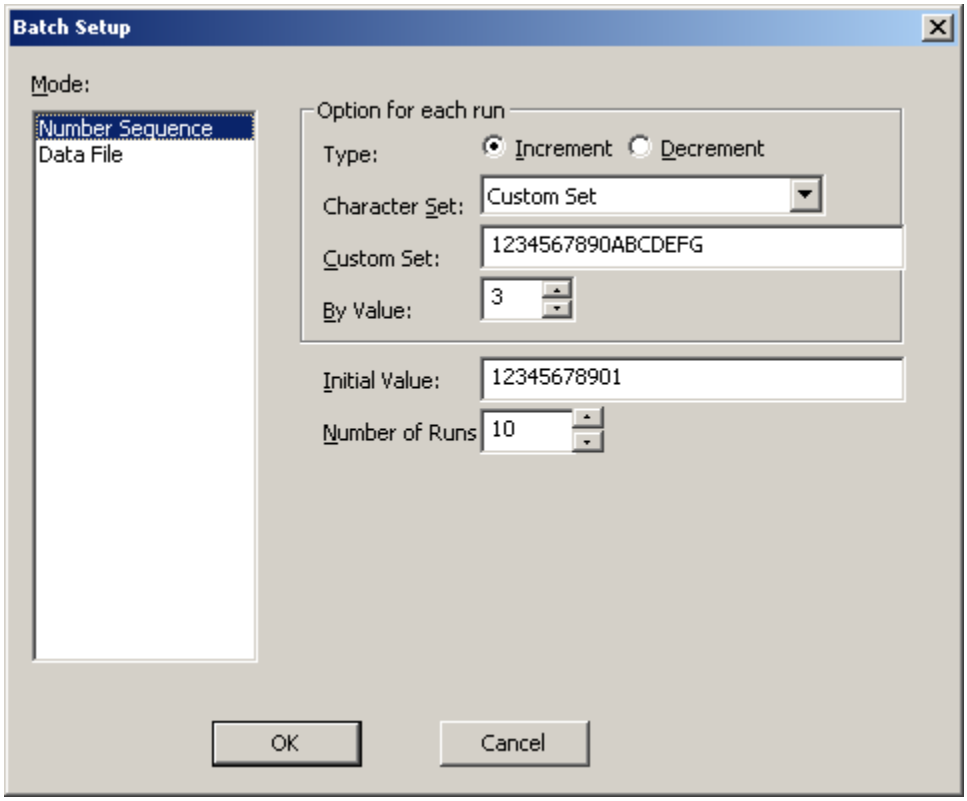
5.2. Batch Printing

Version 3.3 adds powerful batch printing functionality, which allows users to specify a number sequence or a data file as the data source.

To set up the data source, click on the Batch Setup... button on Print dialog.

The Batch Setup dialog provides two operating modes: `Number Sequence` and `Data File`.

Figure 5.2. Batch Setup Dialog



5.2.1. Number Sequence

Number Sequence allows you to define a series of data started from `Initial Value`, incremented or decremented by a specified value within a character set specified. A simple example is to print barcodes with data 000 ~ 999 encoded (total 1,000 labels). You can specify the sequence as:

- **Type**: Increment
- **Character Set**: Numeric Only
- **By Value**: 1
- **Intial Value**: 000
- **Number of Runs**: 1000

5.2.1.1. Number Wrap

The number sequence algorithm assumes that the number created has fixed length (which is implicit through the `Intial Value`. If you specify 000 as the intial value, all numbers generated will be fixed with 3 digits. The significant digit rolls back to zero when the value goes beyond the maximum value. For example, if you specify the Number of Runs as 1001, the last run will go back to 000, instead of 1000. This is called *Number Wrap*. For this reason, always make sure that you put enough leading zeros in the intial value.

5.2.1.2. Options

Number Sequence dialog supports the following options:

Type

Allows you to specify the movement direction of the alogorithm: Increment or Decrement.

Character Set

This function allows you to specify the character set combination. Monterey Barcode Creator supports the following combinations:

- *Numeric Only*. This is the default option. The algorithm operates on an integer counter. For exmaple: 000, 003, 006, 009, 012...
- *Uppercase Alphanumeric*. This character set includes all digits and all upper case letters, with upper case letters at higher position. Example: AA9, AAA, AAB, AAC, AAD...
- *Upperscase Alpha*. This character set includes all upper case letters only. Example: AAX, AAY, AAZ, ABA, ABB...
- *Hexadecimal*. The algorithm operates on a hexadecimal counter. For example: 009, 00A, 00B, 00C...
- *Custom*. It indicates that you are supplying your own character set (in the Custom Set box).

Custom Set

If you choose a custom set, you must enter the allowable characters in this set. Note that the order of characters is also important. For example, `0123ABCD` is a different custom set from `0A1B2C3D`. In the former case, 333 becomes 33A after being incremented by 1. In the latter case, the result is 33D.

For example, suppose that your order number is uppercase alphanumeric and does not contain characters O (to be confused with digit 0), I (to be confused with 1) and Q. Selet Custom in the Character Set box, and fill the Custom Set with the value below:

```
0123456789ABCDEFGHJKLMNPRSTUVWXYZ
```

By Value

Sets the interval by which the number increments or decrements.

Intial Value

Sets the value for the first label in the series.

Number of Runs

Sets the number of runs after which the printing stops.

5.2.2. Data File

Data File allows you to specify a comma separated file (.csv) and the column from which the data is taken.

File Path

The path of the file.

Column

The column number, or the name of the column.

Chapter 6. Using Barcode Creator in MS Word, Excel and other programs

Monterey Barcode Creator can exchange drawings with other Windows programs. It is specially designed to work closely with **Microsoft Office** programs, such as Word™ Excel™ and PowerPoint™.

6.1. Inserting Drawings into Microsoft Office Prorams

You can use the methods below to transfer barcode drawings into Microsoft Office programs. We use Word as an example, but you can apply to other programs as well.

- **Copy and Paste**

  The easist way to transfer drawings you created in Barcode Creator is to simply Copy the drawing in Barcode Creator. Select the Copy command under the Edit menu, or click the edit button on the Standard toolbar, follow by pasting it in Microsoft Word (or other programs).
- **Using the Insert command**

  You don't have to actually run Barcode Creator at all, in order to insert a Barcode Creator drawing into a Word document. Word has an Insert Object... command on its Insert menu. You can use this command to insert a Barcode Creator drawing directly into your Word document.

  When you use the Word Insert command, Word automatically launches Barcode Creator, so that you can select, modify, or create the drawing you want to insert.

  When you insert a new drawing, the template is used to create a barcode.
- **Drag and Drop**

  You can also drag selected parts of a drawing from Barcode Creator into Word, Powerpoint or other Office programs.

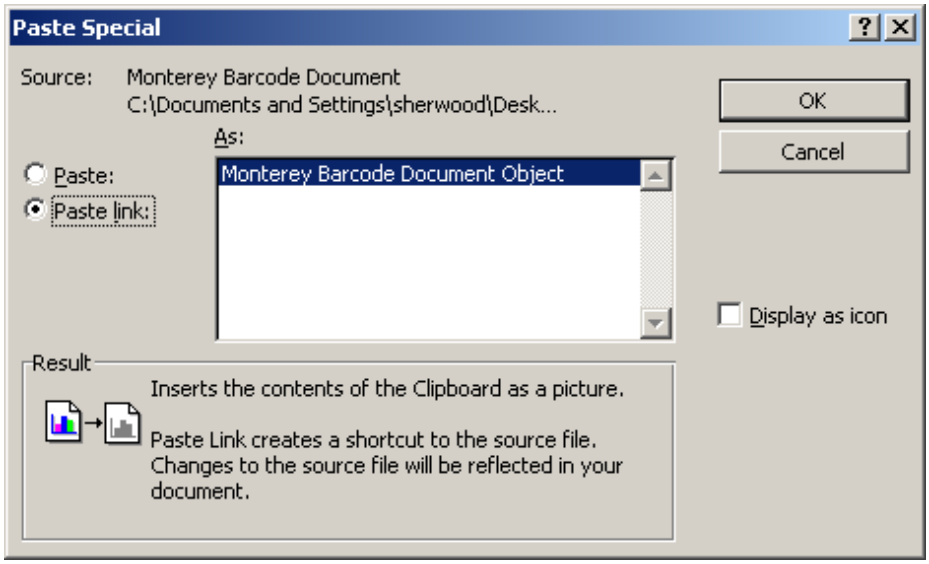
6.2. Understanding OLE (Object Linking and Embedding)

Because Word (Excel, Powerpoint etc.) is an OLE client and Barcode Creator is an OLE server, Word stores all the drawing information in its document when you paste it, not just the picture you see. This is called **Embedding**. All properties of the drawing are *embedded* in Word document, and you can revisit the drawing later on.

If you double-click on the Barcode drawing in Word, it will launch Barcode Creator and you can edit it through Barcode Creator.

Using embedding approach, it increases the size of the Word document. When there are many barcodes in a single document, it slows down the program. An alternative way is to paste the link only, through Word's paste special command.

Figure 6.1. Paste Object Link



When you double-click on the *linked* Barcode Creator drawing in Word, it opens the original Barcode Creator file, allowing you to edit it. OLE linking is useful if you want a drawing shared by multiple documents. It also reduces the document size. Changing the one linked drawing changes all the linked copies of the same drawing.

6.3. Inserting Object with the Insert Command

You can also add barcodes into your documents with the Insert Object command from the Edit menu in Word.

Figure 6.2. Insert Object Dialog (I)

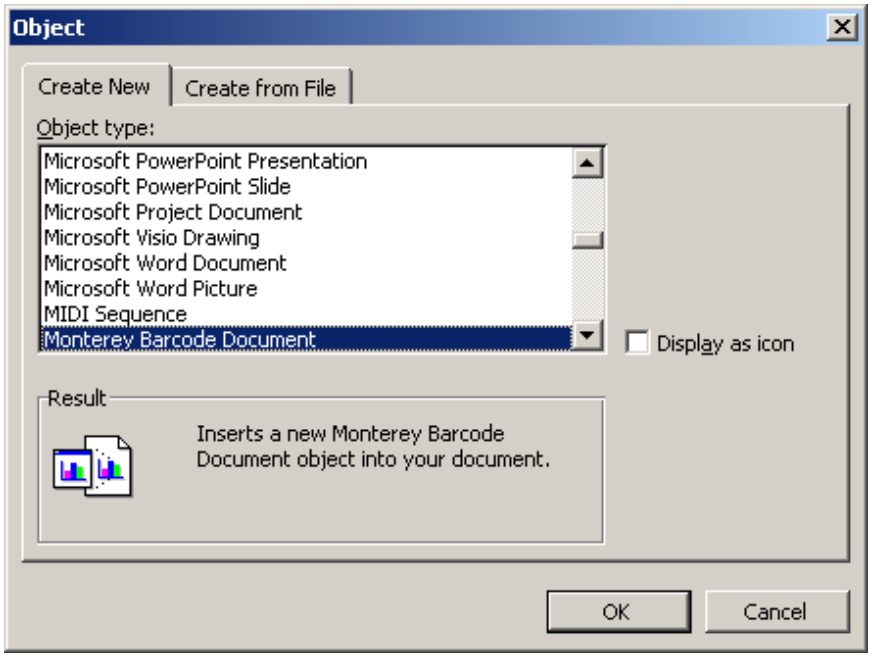
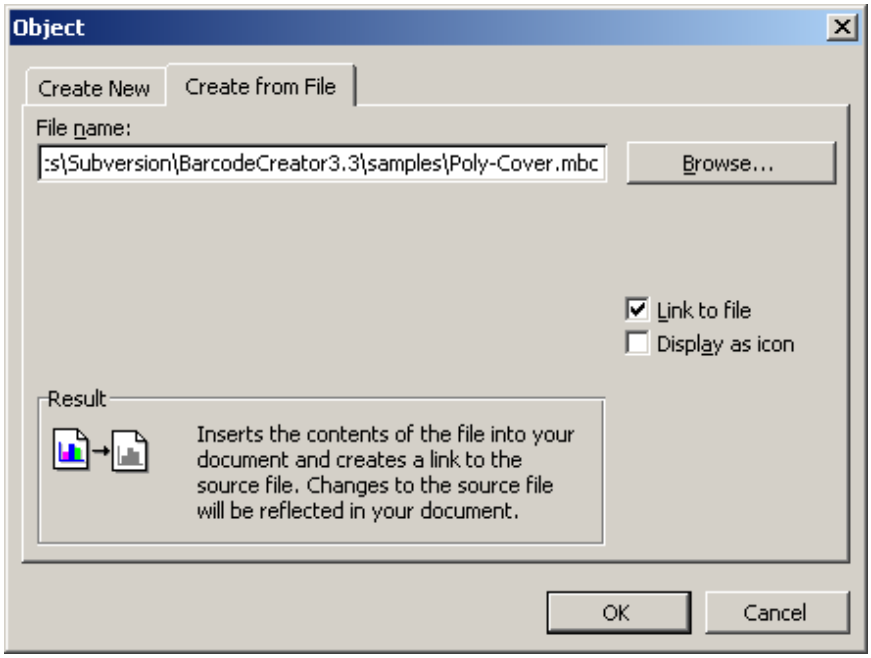


Figure 6.3. Insert Object Dialog (II)

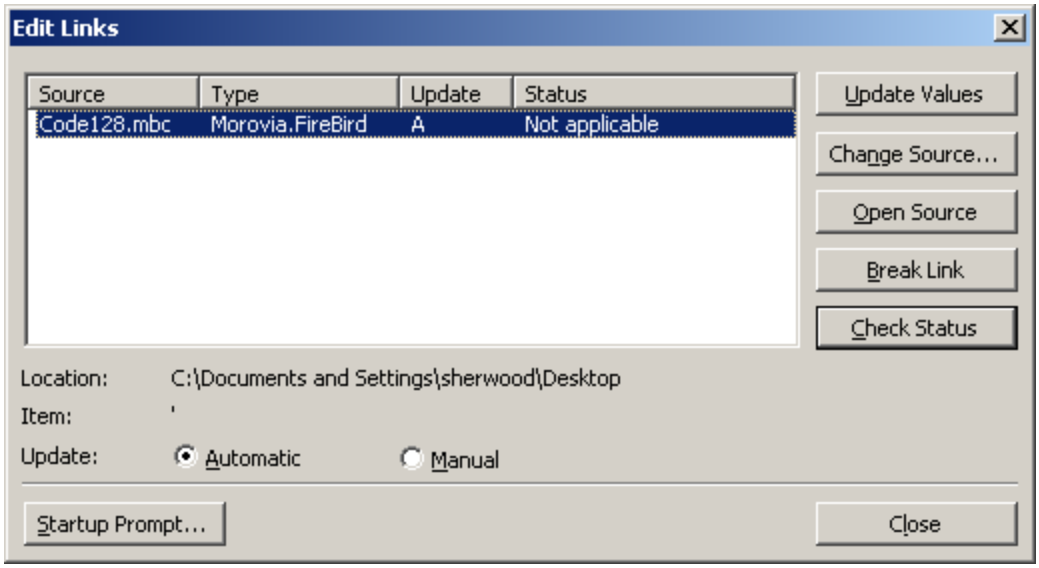


Link to file option allows you to place a link to a physical file, instead of copying the contents into the Word program.

6.4. Managing OLE Object Links

When an OLE linked object is selected, the Links command under the Edit menu will activate the Link dialog. You can use this dialog to manage OLE links in your document.

Figure 6.4. Link Dialog



Chapter 7. Barcode Properties Reference

In this chapter, you will find detailed information about each barcode object property. Some properties may not be modified under certain design mode. Some properties may be related to other properties - i.e. change to one property will change other properties. For example, changing `Symbology` property will also alter the value of `Message` property.

7.1. List of Properties

Table 7.1. List of Barcode Object Properties

BackColor	Specifies the background color for the control.
BarHeight	Specifies the height of the bars in the control, in user units.
BearerBars	Determines whether to include the bearer bars around the barcodes. Applicable on selected symbologies.
BorderColor	Specifies the border color.
BorderStyle	Specifies the border style.
BorderWidth	Specifies the border width, in logical units.
Code25OptionalCheckDigit	Determines whether to include an optional checksum digit in all Code25 barcodes.
Code39OptionalCheckDigit	Determines whether to include an optional checksum digit in all Code 39 barcodes.
Code39StartStopChars	Determines whether to display the start and stop characters in the human readable of all code 39 barcodes.
Comment	Specifies the text string for the human readable comment printed around the barcode.
CommentAlignment	Determines how the comment are aligned.
CommentFont	Specifies the font used to draw comment text.
CommentMarginBottom	Specifies the margin on the bottom of the comment box.
CommentMarginLeft	Specifies the margin on the left of the comment box.
CommentMarginRight	Specifies the margin on the right of the comment box.
CommentMarginTop	Specifies the margin on the top of the comment box.
CommentOnTop	Determines whether the comment box is placed above the barcode image.
Font	Specifies the font used to draw human readable text.
ForeColor	Specifies the foreground color of the control.
I2of5OptionalCheckDigit	Deprecated in version 3.6.
Message	Specifies a string which represents the data to be encoded.
NarrowBarWidth	Specifies the width of the narrowest module in linear symbologies.

NarrowToWideRatio	Specifies the ratio used to calculate the width of the wide element. Applicable on selected symbologies.
QuietZones	Determines whether to include quiet zones in the barcodes.
RasterImageResolution	Specifies the resolution which is used to export raster images.
Rotation	Specifies the rotation direction and degrees.
ShowCheckDigit	Determines whether to include the checksum character in the human readable.
ShowComment	Determines whether the control displays the comment element.
ShowHRText	Determines whether to display the human readable text.
SymbolMarginBottom	Specifies the margin on the bottom of the symbol.
SymbolMarginLeft	Specifies the margin on the left of the symbol.
SymbolMarginRight	Specifies the margin on the right of the symbol.
SymbolMarginTop	Specifies the margin on the top of the symbol.
Symbology	Specifies the barcode format (symbology).
TexAlignment	Specifies how the human readable text is aligned.
TextOnTop	Determines whether the human readable text is placed above the barcode image.
UccEanOptionalCheckDigit	Deprecated in version 3.6

7.2. BackColor, ForeColor Properties

Description

BackColor - returns or sets the background color of the control.

ForeColor - returns or sets the foreground color of the control.

Remarks

For opening systems, we strongly recommend to set the background color to solid white (`0xFFFFFF`) and foreground color to black (`0x000000`). Note: barcode requires decent contrast between the foreground color and the background color, in order to be readable. Always test the readability thoroughly when you select a color pair different from black and white.

7.3. BarHeight Property

Description

Returns or sets a value for the height of bars in barcode control.

Remarks

The **BarHeight** property specifies the height of the dark elements in all linear symbologies with exception (see notes below). The actual value is affected by the *Measurement* property. If *Measurement* is set to `mbxMeasureEnglish`, the unit for this property is mils (`1/1000` inch), otherwise it is `1/1000` cm. The default value is `1000` which translates to `1` inch or `1` cm, depending on the measurement unit specified.

This property have no effect on the size of two-dimensional barcodes, such as *PDF417*, *DataMatrix* and *MaxiCode*.

The height of elements in postal symbologies (*POSTNET* and *RoyalMail*) is fixed. Therefore, changing this property has no effect on those types of barcodes.

The height of bars in a *DataBar Truncated* symbol is fixed at 13X (X is the industry term for *NarrowBarWidth*), and the height of a *DataBar Stacked* symbol is fixed at 50X. Therefore, this property does not affect the height of those two types of symbols.

In stacked symbologies (*DataBar Stacked Omnidirectional* and *DataBar Expanded* (multi-row), the overall height is the number of rows multiplying *BarHeight*, plus the height of any required separator rows.

7.4. BearerBars Property

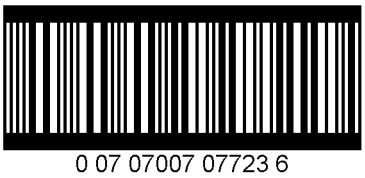
Description

Returns or sets a value that determines whether to include bearer bars around the barcode.

Remarks

Bearer bars (see below) are horizontal bars printed across the top and bottom of the barcode image. Bearer bars can help to avoid partial reading, should the reader move off the top or bottom of the code. Only certain symbologies require bearer bars (for example Interleaved 2 of 5), because the start and stop characters in most barcodes make bearer bars unnecessary.

In Barcode Creator, the following symbologies can have bearer bars: *Codabar*, *Code11*, *Code25*, *Code128*, *UCC/EAN-128*, *Code39*, *Code39 HIBC*, *Code 39 Full ASCII*, *Code93*, *Interleaved 2 of 5*, *MSI/Plessey* and *Telepen*. Other symbologies ignore this property.



7.5. BorderColor Property

Description

Returns or sets the color of borders.

Remarks

Use this property to specify the border color. The default value is `0` (black).

See Also

Section 7.7, “BorderWidth Property”

Section 7.6, “BorderStyle Property”

7.6. BorderStyle Property

Description

Returns or sets a value that determines the border style.

Remarks

Use **BorderStyle** property to specify the border style. This property is set by using one of the BorderStyle enumeration values:

Table 7.2. Border Styles

Constant	Value	Description
mbxBorderStyleNone	0	No border lines
mbxBorderStyleSolid	1	Solid line
mbxBorderStyleDash	2	Dash line
mbxBorderStyleDot	3	Dot line
mbxBorderStyleDashDot	4	Dash dot line
mbxBorderStyleDashDotDot	5	Dash dot dot line

See Also

Section 7.5, “BorderColor Property”

Section 7.7, “BorderWidth Property”

7.7. BorderWidth Property

Description

Returns or sets the value for border width.

Remarks

Use **BorderWidth** property to specify a border width. The border width is expressed in logical units prescribed by the **Measurement** property. For example, if you set this property to `15` and the *Measurement* is `mbxMeasureEnglish`, the border width is 15 mils (0.015 inch). The default value is `15`.

To disable the border, set BorderWidth to 0 or BorderStyle to `mbxBorderStyleNone`.

See Also

Section 7.6, "BorderStyle Property"

Section 7.5, "BorderColor Property"

7.8. Code25OptionalCheckDigit Property

Description

Returns or sets a value that determines whether to include an optional checksum digit in all Code25 barcodes produced by Barcode Creator.

Remarks

A code 2 of 5 barcode can have an optional check digit. When the **Code25OptionalCheckDigit** is `TRUE`, a check digit is calculated using modulo 10 algorithm and added to a code 2 of 5 barcode. To display the checksum digit in the human readable text, set ShowCheckDigit to `TRUE`.

See Also

Section 8.7, “MSI/Plessey, Code 25 and Code11”

7.9. Code39OptionalCheckDigit Property

Description

Returns or sets a value that determines whether to include an optional checksum digit in all Code39 barcodes produced by Barcode Creator.

Remarks

A code 3 of 9 symbol can have an optional check digit (character) at the end of the barcode. When the Code39OptionalCheckDigit property is set to `TRUE`, a check digit is calculated using modulo 43 method and appended to the end of the barcode. To display the checksum digit, set **ShowCheckDigit** to `TRUE`.

This property affects two symbologies: Code 39 and Code39 Full ASCII.

See Also

Section 8.2, “Code 39”

Section 8.3, “Code 39 Full ASCII”

7.10. Code39StartStopChars Property

Description

Returns or sets a value that determines whether to display the start and stop characters in the human readable text in all Code39 barcodes produced by Barcode Creator.

Remarks

For historical reasons, many code39 symbols print start/stop characters (asterisks) at the beginning and the end of the human readable text. While the start and stop characters are always present in the barcode, it is not necessary for them to appear in the human readable. When the Code39StartStopChars property is set to `TRUE`, the asterisks are displayed at both the beginning and end of the human readable.

This property affects the three Code39 symbologies - *Code 39*, *HIBC* and *Code39 Full ASCII*.

Note The asterisks are not part of the encoded data. You should not include asterisks in *Message* property when creating Code39 barcodes.

See Also

Section 8.2, “Code 39”

Section 8.4, “Code 39 HIBC”

Section 8.3, “Code 39 Full ASCII”

7.11. Comment Property

Description

Returns or sets a string for the comment to be printed around the barcode symbol.

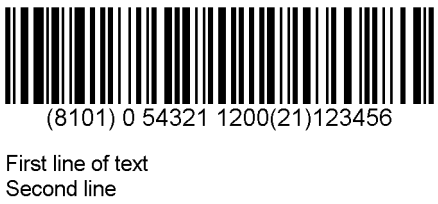
Remarks

In addition to the human readable, which always reflects the encoded data and conforms to the standard requirements, you can optionally place a paragraph of text beside the barcode image.

You may adjust margins around the comment, place the comment on the top or bottom, modify the font typeface as well as the size, and change how the text is aligned.

Control characters are not printed.

Note It is now possible to enter multiple paragraphs in the comment by inserting \n at the end of each paragraph (except the last one). For example, the string **`First paragraph\nSecond Paragraph`** renders two paragraphs, as illustrated below:



See Also

Section 7.13, “CommentFont Property”

Section 7.12, “CommentAlignment Property”

Section 7.25, “ShowComment Property”

Section 7.15, “CommentOnTop Property”

Section 7.14, “CommentMarginTop, CommentMarginBottom, CommentMarginLeft, CommentMarginRight Properties”

7.12. CommentAlignment Property

Description

Returns or sets a value indicating how the comment is aligned.

Remarks

This property controls how the text in the comment portion is aligned. Valid alignment choices are listed in the table below:

Table 7.3. CommentAlignment Options

Constant	Value	Description
mbxAlignLeft	0	Left alignment (default). Align the text to the left edge of the comment box.
mbxAlignRight	1	Right alignment. Align the text to the right edge of the comment box.
mbxAlignCenter	2	Center alignment. Align the text to the center of the comment box.
mbxAlignJustify	3	Justify alignment. Align the text to both edge of the comment box.

7.13. CommentFont Property

Description

Returns or sets the font for comment text.

Remarks

The default font used to draw comment text is typeface of `Arial`, `8` points.

This property is used to retrieve/set the font used for comment text. To set/retrieve the font used for human readable text, use *Font* property.

7.14. CommentMarginTop, CommentMarginBottom, CommentMarginLeft, CommentMarginRight Properties

Description

These four properties control the margins around the comment box.

Remarks

The above four parameters control the margins around the comment text box.

7.15. CommentOnTop Property

Description

Returns or sets a value that determines whether the comment box is placed above or below the symbol.

Remarks

The default value for CommentOnTop is `FALSE`. To place the comment on top of the image, set this property to `TRUE`.

7.16. Font Property

Description

Returns or sets the font for human readable text.

Remarks

The default font used to draw human readable text is typeface of `Arial, 9` points. Generally speaking, you should use a sans-serif font for human readable text. Some industries require `OCR-B`(Optical Character Recognition Revision B) font to be used.

This property is used to retrieve/set font for human readable text. To set /retrieve font used for comment, use *CommentFont* property.

See Also

Section 7.26, “ShowHRText Property”

Section 7.29, “TexAlignment Property”

Section 7.30, “TextOnTop Property”

7.17. I2of5OptionalCheckDigit Property

Description

Deprected since 3.6.

Remarks

Previously, in order to add check digit to an Interleaved 2 of 5 bracode, you need to set this property to `TRUE`. Interleaved 2 of 5 symbology requires the input to be even length. If this property is TRUE and the input already has even length, the previous implement appends a '0' at the end, and calculate the check digit. This is an unexected behavior for many customers.

In version 3.6 and above, this property has no effect on the barcode created. Whether or not a check digit is required depends on if the length of the input is even or odd. If the length is even, no check digit is added and Barcode Creator encodes as is. If the length is odd, however, the program calculates the check digit and automatically appends at the end to make the whole length even.

See Also

Section 8.13, “Interleaved 2 of 5 (ITF25)”

7.18. Message Property

Description

Returns or sets a string for the message to be encoded.

Remarks

Not all symbologies are capable of encoding all characters. Some may only encode numeric data. Some impose a limit on the length of the encoded data. If you encode data with invalid characters or length, Barcode Creator returns an error.

- UPC symbologies (UPC-A, UPC-E, EAN-13, EAN-8)

  A UPC symbol may have an optional 2-digit or 5-digit add-on barcode. To create an add-on barcode, separate the main data and the extension data with a vertical bar. For example, the input **`1-932111-39-5|55999`** produces a Bookland barcode with a 5-digit add-on symbol.

- GS1-128 symbology

  To ensure the human readable format is correct, the AI and field ID must be enclosed with parentheses (()). If the data is formatted incorrectly, you may end with an error. For example, the following data is valid for UCC/EAN 128 message input:

  ```
  (01)12345678901231
  ```

  Additional information is also needed to create a shortest possible barcode. Refer to Section 8.12, “UCC/EAN-128” for more details.

- Tilde codes

  Tilde code sequence can be used to enter special characters, such as extended ASCII characters and symbology-specific characters if supported. See each Symbology section for details.

7.19. NarrowBarWidth Property

Description

Returns or sets a value for the width of the narrowest module in linear symbologies.

Remarks

This property defines the width of the narrowest element in a linear barcode - a.k.a *X-dimension*. The measurement unit is in either 1/1000 inch or 1/1000 cm depending on the Measurement unit used.

By default the value for this property is `13`. The valid range is from `1` to `1000`. Industry standards require that the barcodes used in an open system have a X-dimension at least of 10 mils (one-hundredth of inch). If the X-dimension is too small, some scanners may have problems reading the barcode.

This property affects most linear symbologies. Height-modulated postal barcodes, such as POSTNET and Royal Mail barcodes, use fixed pitch; thus this property has no effect on these symbologies.

7.20. NarrowToWideRatio Property

Description

Returns or sets the ratio of the wide to narrow bar in a barcode.

Remarks

Some linear symbologies can have two module widths. The width of the wide one is a fixed multiple of the width of the narrow module (*NarrowBarWidth*). You can choose a value ranging from `2.0` to `3.0` for this ratio.

This property is valid only for Code 39, Code 25, Code 11, Codabar and Interleaved 2 of 5 symbologies. All others ignore this property. We also recommend you set a value between `2.5` to `3.0`, so the barcode can be easier to be recognized.

Since the value may impact the readability of the barcode, we highly recommend that you test the barcode readability when you set the value to anything below `2.5`.

7.21. QuietZones Property

Description

Returns or sets a value that determines whether to include quiet zones on the barcodes generated.

Remarks

For linear barcodes, *quiet zone* is defined as a clear space that precedes the start character of a barcode symbol or follows the stop character. For two-dimensional barcodes, quiet zones are clear area around the barcode. The spaces are required to help scanner determine where the barcode starts and stops.

The width of space added is 10 times the *NarrowBarWidth* value for all linear barcodes, 2 times *PDFModuleWidth* value for PDF417 barcodes, 2 times *DataMatrixModuleSize* value for DataMatrix barcodes and 1 element width for MaxiCode barcodes. Setting this property to `TURE`, substantially increase the barcode length for linear symbologies.

You can also use symbol margins to create effective quiet zones. By default Barcode Creator set the symbol margins to 100 mils at 4 directions. When this is the case, you may safely set this property to `FALSE` to better align the comment and human readable text.

7.22. RasterImageResolution Property

Description

Returns or sets a value that corresponds to the resolution (in pixels per inch) of the target device when export barcode images to a raster graphics file format (JPEG, GIF, PNG, TIF and BMP).

Remarks

When you export the barcode image into a raster graphics file format, such as *JPG*, *GIF* and *PNG*, you are converting the drawing commands (device independent) to an array of pixels which are device dependent. The size of a pixel varies based on the device and usually is measured by dot per inch (dpi). A laser printer usually has a high resolution of 300 dpi, while the screen has a low resolution of 96 dpi. As a result, an image may have different physical sizes when displayed on the screen than printed. The greater the resolution is, the bigger the file size and the accurate of the details. We suggest you set this property to the value which matches your printer.

The default value for this property is `300`.

See Also

7.23. Rotation Property

Description

Returns or sets a value indicating how to rotate the working area.

Remarks

This property controls how the working area is rotated. Valid rotation choices are:

Table 7.4. Roation Options

Cosntant	Value	Description
mbxRTZeroDegree	0	No rotation
mbxRTAntiClockwise_90	1	Rotate at 90 degrees angle counterclockwise
mbxRTAntiClockwise_180	2	Rotate at 180 degrees angle counterclockwise(upside down)
mbxRTAntiClockwise_270	3	Rotate at 270 degrees angle counterclockwise

7.24. ShowCheckDigit Property

Description

Determines whether the checksum characters will be shown on the human readable portion. This option is effective to selected symbologies only.

Remarks

Different symbologies have different rules regarding check digit. For some symbologies, check digit is part of the data and should always be included in the human readable text. Some symbologies allow optional check digit. Some symbologies require check character not be displayed at all.

- Check digit is part of data and is always displayed.

  This category includes UPC-A, UPC-E, EAN-13, EAN-8, Bookland, and UCC/EAN-128. This property has no effect on these symbologies.
- Check digit is required, but not treated as part of data and is never included in the human readable text.

  This category includes Code 128, Telepen and Telepen Numeric.
- Check digit is required, and can be optinally included into the human readable text.

  This category includes Code 93, Code 11, POSTNET, PLANET and MSI/Plessey.
- Check digit is optional, and can be optionally included in the human readable text.

  This category includes Code 39, Code 39 Full ASCII, HIBC.

In version 3.6, there are some noteable changes:

- Previously, HIBC barcodes may turn off its check digit in the human readable display (although the check digit always appear in the barcode). After 3.6, the check digit is always included in the human readable text, as required by the standard.
- Before 3.6, whether a UCC/EAN-128 check digit is calculated depends on *UccEanOptionalCheckDigit*. After version 3.6, the check digit is always included in the human readable text.

See Also

Section 7.26, “ShowHRText Property”

Section 7.8, “ Code25OptionalCheckDigit Property ”

Section 7.9, “Code39OptionalCheckDigit Property”

Section 7.17, “I2of5OptionalCheckDigit Property”

7.25. ShowComment Property

Description

Returns or sets a value that determines whether the symbol displays the comment portion.

Remarks

Toggle this property to turn on or turn off the display of the comment portion. Note that if this property is `FALSE`, comment margins will not be included during the position calculation of other components, such as working area, bar code image etc. If you want to have these margins participate the calculation and do not want to see the comment, set *Comment* property to an empty string instead.

7.26. ShowHRText Property

Description

Returns or sets a value that determines whether the symbol displays the human readable portion.

Remarks

Toggle this property to turn on or turn off the display of the human readable text.

Two dimensional barcodes do not have the concept of "human readable". Consequently this property has no effect on 2D barcodes.

Per standard, UPC-A, UPC-E, EAN-13, EAN-8 barcodes and their supplements should always have the human readable as an integrated part of the image. In versions prior to 3.2, you can not produce these barcodes without visible human readable, even you set *ShowHRText* to `FALSE`. This behavior has changed since version 3.2. Unless you have absolute reason to turn it off, you should set *ShowHRText* to `TRUE` when creating these types of barcodes.

Note The width of human readable text portion never exceeds the barcode length. If the barcode length is too small, the text will wrap into multiple lines. If this is not desired, reduce the font size, or place the human readable text into comment and adjust comment margin properties to increase the width of comment box so that the text stays in one line.

7.27. Symbology Property

Description

Returns or sets a value indicating the type of the barcode format (symbology) to be generated by the ActiveX control.

Remarks

The Barcode Creator currently supports the following symbologies:

Table 7.5. Symbology Options

Constant	Value	Description
mbxCode39	0	(default) Code 39 (43 character set)
mbxCode39_Full_ASCII	1	Code 39 Full ASCII
mbxCode39_HIBC	2	Code 39 Mod 43 (Health Industry Bar Code)
mbxCodaBar	3	Codabar
mbxCode93	4	Code 93
mbxCode128	5	Code 128
mbxUCC_EAN_128	6	UCC/EAN 128
mbxInterleaved_2of5	7	Interleaved 2 of 5 (ITF25)
mbxUPC_A	8	UPC-A
mbxUPC_E	9	UPC-E
mbxEAN_13	10	EAN/JAN-13
mbxEAN_8	11	EAN/JAN-8
mbxBookland	12	Bookland
mbxTelepen	13	Telepen
mbxTelepenNumeric	14	Telepen Numeric (double density)
mbxPostnet	20	PostNET (barcode used by USPS)
mbxPlanet	21	Planet (used by USPS for package tracking)
mbxRoyalMail	22	Royal Mail (U.K. Postal)
mbxMSI_Plessey	30	MSI/Plessey
mbxCode25	31	Code 25
mbxCode11	32	Code 11

Some symbologies only encode certain limited set of characters, such as digits. Some symbologies impose limit on the data length; some require checksum characters. If you are not familiar with the symbologies you are working on, refer to Chapter 8, *Barcode Technologies* to get some hands-on information.

7.28. SymbolMarginTop, SymbolMarginBottom, SymbolMarginLeft, SymbolMarginRight Properties

Description

These four properties control the margins around the symbol boundary (including barcode, human readable and comment).

Remarks

These four parameters control the margins around the symbol (barcode, human readable and comment).

7.29. TexAlignment Property

Description

Returns or sets a value indicating how the human readable text is aligned.

Remarks

This property controls how the text in the human readable portion is aligned. Valid alignment choices are:

Table 7.6. TexAlignment Options

Constant	Value	Description
mbxAlignLeft	0	Left alignment (default). Align the text with left edge of the comment box.
mbxAlignRight	1	Right alignment. Align the text with the right edge of the comment box.
mbxAlignCenter	2	Center alignment. Align the text with the center of the comment box
mbxAlignJustify	3	Justify alignment. Align the text to both edge of the comment box.

Because of the unique character arrangement in UPC/EAN symbologies, this property does not apply to those symbologies: UPC-A, UPC-E, EAN-13 and EAN-8.

The barcodes below illustrate the effects of *TexAlignment*:

See Also

Section 7.16, “Font Property”

Section 7.26, “ShowHRText Property”

7.30. TextOnTop Property

Description

Returns or sets a value that determines whether the human readable text is placed above the barcode image or below the image.

Remarks

The default value for TextOnTop is `FALSE` ,which places the human readable text below the barcode. To place the human readable text above the barcode, set *TextOnTop* to `TRUE`.

See Also

Section 7.16, “Font Property”

Section 7.26, “ShowHRText Property”

Section 7.29, “TexAlignment Property”

7.31. UccEanOptionalCheckDigit Property

Description

Deprecated since version 3.6.

Remarks

Before version 3.6, This property kicks in when all the following conditions are met: (1) The current symbology is set to UCC_EAN_128. (2) The data element contains an AI of 00 (*SSCC-18*) or 01(*SCC-14*). (3) The data length is 1ess than the required. The check digit is calculated based on Mod 10 algorithm and appended to the end of the data part. The check digit also appears in the human readable text.

In version 3.6 and above, this property kick in automatically when the program finds that the input is 1 digit short. Setting the property does not change the program behavior.

Chapter 8. Barcode Technologies

8.1. Introduction

Barcode has been widely adopted across all major industries. A conventional barcode is a machine readable symbol consisting of a series of parallel, adjacent bars and spaces. The basic barcode structure features leading and trailing quiet zones, a *start character*, one or more data characters, one or more *check characters* (optional) and a *stop character*.

Barcode has a long development history that spanned half a century. During the evolution process, many formats have been developed and adopted by industries. Around a dozen of them are actively used today.

The term "symbology" is the scientific name for the barcode format. Different symbologies have different characteristics, such as the encoding efficiency and character set. The *character set* defines what kind of data the symbology encodes. Typically there are four types of character sets: (1) numeric. Only digits can be encoded. (2) alpha-numeric. The symbology is capable of encoding numbers, letters plus several punctuations. (3) full ASCII. All characters in the ASCII set, with value between 0 and 127, can be encoded. (4) Binary. Binary character set includes all 256 characters in a 8-bit single byte character set. Most of two dimensional symbologies are capable of encoding arbitrary binary data.

Some symbologies may impose length requirements. For example, UPC-A encodes the numeric data of exact 12 digits.

Two dimensional symbologies are usually capable of encoding thousands of characters.

Monterey Barcode Creator supports the following symbologies:

Table 8.1. Symbologies supported by Monterey Barcode Creator

Symbology	Also Known As
Code 39	Code 3 of 9, AIAG, USS Code 39
Code39 Full ASCII	Code 39 Extended
HIBC Code 39	HIBC, LOGMARS
Codabar	Rationalized Codabar
Code 93	
Code 128	USS-128, C-128
GS1-128	UCC 128, EAN 128
Interleaved 2 of 5	ITF, ITF-14, I 2 of 5
UPC-A	
UPC-E	
EAN-13	
EAN-8	
Bookland	
Telepen, Telepen Numeric	
Postnet, Planet	

Symbology	Also Known As
Royal Mail	UK Postal Code, RM4SCC
MSI/Plessey	Plessey Code
Code 25	Industry 25, Code 2 of 5
Code 11	

You can purchase symbology standards directly from AIM Inc. The web address of *AIM* is http://www.aimglobal.org[1].

8.2. Code 39

Code 39 (also known as USS Code 39, Code 3 of 9) is the first alpha-numeric symbology developed to be used in non-retail environment. It is widely used to code alphanumeric information, such as the model number, etc. It is designed to encode 26 upper case letters, 10 digits and 7 special characters:

```
A, B, C, D, E, F, G,
H, I, J, K, L, M, N, O, P, Q,
R, S, T, U, V, W, X, Y, Z
0, 1, 2, 3, 4, 5, 6, 7, 8, 9
-, ., *, $, /, +, %, SPACE.
```

Each code 39 symbol begins with a start character and ends with a stop character. Traditionally the start/stop characters are represented by asterisk character (*). Due to this reason, some applications include asterisks in the human readable text. The asterisks are not part of the encoded message and should not appear within the message.

Code 39 allows an optional checksum digit based on modulo 43 algorithm. The health industry has adopted the use of the check character for health applications and these types of barcodes are often referred as **HIBC**.

Property *Code39OptionalCheckDigit* specifies whether an additional *check digit* should be added to the barcode. Another property, *Code39StartStopChars*, when it is set to `TRUE`, adds the traditional start/stop characters (*) to the beginning and the end of the human readable text.

8.3. Code 39 Full ASCII

The Code 39 Full ASCII (sometimes also referred as Code 39 extended) is an extension to normal code 39. It is capable of encoding all 128 *ASCII* characters. It uses shift characters to combine two normal code 39 characters to encode a character not in the normal code 39 character set. The barcode generated is compatible with normal code 39, so a scanner must be configured to Full ASCII mode to read the barcode correctly.

[1] http://www.aimglobal.org

Code 39 Full ASCII supports entering control characters using special character input method. You can use a back slash \ plus 3-digit decimal ASCII code to enter a control character. For example, the following input encodes digits **123**, followed by a **NUL** character and letters **abc**:

```
Data Input: 123\000abc
```

8.4. Code 39 HIBC

Code39 HIBC is exactly the same as normal Code39, except that Code39OptionalCheckDigit property is set to TRUE. The standard also says that the starting character in the message must be a plus (+) symbol. Monterey Barcode Creator automatically adds this plus sign (+) if the encoded message does not meet this requirement.

The HIBC standard requires that the checksum digit to appear in the human readable. To satisfy this requirement, your program should explicitly set property *ShowcheckDigit* to TRUE to create a compliant HIBC symbol.

Setting *Code39OptionalCheckDigit* to FALSE does not affect the resulted barcode.

8.5. Codabar

Codabar is a variable length symbology which encodes a character set of 16 letters (0-9, -, $, :, /, +). It is dubbed as NW-7 in Japan. You may choose one of these four start/stop characters in your symbol: A, B, C and D. If you do not specify the start/stop characters, Monterey Barcode Creator uses A and B as the start/stop characters, respectively. No check digit is required.

8.6. Code 93

Code 93 is a variable length symbology that is capable of encoding all 128 ASCII characters. Code 93 offers higher density than Code 39. It has the same native character set as Code 39 (43 characters), but it uses additional 4 shift characters to encode other characters. Code 93 features 2 checksum characters. Start/Stop characters are also required.

Code 93 supports special character input method. See Code 39 Full ASCII section for details on how to escape control characters.

8.7. MSI/Plessey, Code 25 and Code11

These are rather obsolete symbologies which only encode numeric data. There is no advantage to use them except for application backward compatibility. More information can be found at Morovia barcode library at http://www.morovia.com/education/[2].

[2] http://www.morovia.com/education/

8.8. UPC-A,UPC-E and UPC Supplements

The UPC-A barcode is the most common and well-known symbology in North America. You can find it on the cartons of virtually every consumer goods in your local supermarket, as well as books, magazines, and newspapers. A short form is called UPC-E. Each symbol may have 2-digit or 5-digit supplement to encode additional information.

UPC-A encodes 11 digits of numeric data along with a trailing check digit, for a total of 12 digits of barcode data.

A UPC-A number consists of four elements: (1) the Number System; (2) the manufacturer code; (3) the product code; (4) the check digit. Normally the number system digit is printed to the left of the barcode, and the check digit to the right. The manufacturer and product codes are printed just below the barcode, separated by the guard bar.

The UPC-E barcode is the short form representation of a UPC number. It reduces the data length from 12 digits to 6 digits by compressing the extra zeros. It is suited for identifying products with small packages.

A UPC-E barcode has 6 digits with an implied number system 0. The first 5 digits are calculated based on a conversion algorithm described below. The last digit is the check digit of the original UPC-A symbol.

Both UPC-A and UPC-E symbols allow for a supplemental two- or five-digit add-on barcode. This add-on barcode usually encodes a price or a sequence number. To include a supplemental message, append it to the main message with a vertical bar (|) to separate it from the main message. The supplemental message must consist of exact two or five digits.

Table 8.2. Examples of UPC-A, UPC-E and Supplement

Message	Symbol Created
90123678812	UPC-A
90123678812|02	UPC-A with 2-digit add on
0123456	UPC-E
0123456|95000	UPC-E with 5-digit add on

8.9. EAN-13, EAN-8 and EAN Supplements

EAN is designed by the International Article Numbering Association (EAN) in Europe. It is an extension to UPC-A to include the country information. The only difference between UPC-A and EAN-13 is that the number system in UPC-A is a single digit varying from 0 through 9, whereas an EAN-13 number system consists of two digits ranging form 00 to 99.

EAN-13 encodes 12 digits of numeric data along with a trailing check digit, for a total of 13 digits data.

An EAN-13 number consists of four elements: (1) the Number System; (2) the manufacturer code; (3) the product code; (4) the check digit. Normally the number system digit is printed to the left of the barcode, and the check digit to the right. The manufacturer and product codes are printed just below the barcode, separated by the guard bar.

EAN-8 is the short version of EAN-13, the same as UPC-E vs. UPC-A. While they look very similar, some differences exist. UPC-E does not explicitly encode the first digit (NS), while EAN-8 encodes all 8 digits. From barcode encoding/decoding perspective, an EAN-8 is not compatible with UPC-E. Moreover, although a UPC-E number can be converted back to UPC-A, this is not the case for EAN-8. There is no defined method for conversions between EAN-13 to EAN-8. An EAN-8 number is assigned in the same way as EAN-13.

An EAN-8 number contains 7 digits of message plus 1 check digit. The first two or three digits identify the numbering authority; the remaining 4 or 5 digits identify the product.

Table 8.3. Examples of EAN-13, EAN-8 and Supplement:

Message	Symbol Created
97802161594	EAN-13
978020161594|02	EAN-13 with 2-digit add on
71245126	EAN-8
71245126|95000	EAN-8 with 5-digit add on

8.10. ISBN/Bookland

The International Standard Book Number (ISBN) has been invented for more than 30 years. It has experienced exponential growth and remarkable success. Today, every book, magazine, cassette and CD bear an ISBN number. Every item to be sold in bookstore is required to furnish an ISBN. The ISBN is used extensively by publishers, retailers as wells as libraries to manage inventory. The ISBN is represented through an EAN barcode, a.k.a. Bookland barcode plus an optional 5-digit (2-digit for magazines) add-on.

An ISBN is a 10 digit number preceded by the letters ISBN. The text is usually printed with OCR-A font. The 10-digit number is divided into four parts of variable length, which are separated by hyphens or spaces. The four parts are Group Identifier, Publisher Identifier, Title Identifier and Check Digit respectively. Note that the length of each part is not fixed, though the total length must be 10.

A Bookland symbol may have an optional 2-digit or 5-digit add-on symbol. To add the supplement, add them at the end of the main message and separate the two parts with a vertical bar(|), in the same way as the UPC and EAN supplements. For example, to encode an ISBN number `0-201-61595-9` with pricing information `53995`, set the Message property to `0-201-61595-9|53995`.

Note on 13-digit ISBN

Beginning on January 1, 2007, all 10-digit ISBNs are required to be re-expressed as a 13-digit number (EAN-13). To convert a 10-digit ISBN to 13-digit EAN number, drop the last checksum digit of the 10-digit ISBN number and add prefix `978` at the beginning. Calculate the EAN-13 check digit based on the result and append this checksum digit to the end of the result. To create the barcode, use EAN13 symbology instead and assign the 13-digit ISBN number to the *message* property.

8.11. Code 128

Code 128 is a high-density alpha-numeric symbology. Since introduced in early 1980s, it has gained wide popularity in many industries. UCC/EAN derives its retail carton tracking standard UCC/EAN 128 based on Code 128 symbology.

Code 128 is a variable length, continuous symbology with multiple element widths. Every Code 128 symbol has a check character. Each character is encoded with three bars and spaces, in total 11 modules.

In the most recent standard *ISO/IEC 15417*, Code128 is extended to encode all 256 characters of a single-byte character set[3]. The default character set is *ISO 8859-1* (Latin Alphabet No. 1).

Code 128 standard also defines four function codes for special purposes. `FNC2` is used to tell barcode reader to store the data and transmit with next symbol; `FNC4` is used as a latch code word to switch into extended ASCII mode. `FNC3` is reserved for future use. `FNC1` is used in UCC/EAN128 to act as UCC/EAN-128 identifier and field delimiter.

8.11.1. How Monterey Barcode Creator Implements Code128

Monterey Barcode Creator allows encoding all 256 characters as well as 4 special symbol characters: `FNC1`, `FNC2`, `FNC3`and `FNC4`.

Internally Code128 defines 3 character sets (`A`, `B` and `C`) to allow efficient encoding. Each character set contains 103 characters (including special symbol characters). A code128 symbol starts with one character set and latches to a different set with a latch codeword. Since these three character sets overlap, it is possible to get different barcodes with the same data encoded.

To allow space efficiency, during the encoding process, the Monterey Barcode Creator selects the proper character sets and inserts necessary shift characters to make the symbol generated as short as possible.

Code128 requires a checksum character to ensure the data integrity. The checksum character has no meaning to the end user. Monterey Barcode Creator does not transmit the checksum digit back to the human readable text.

Note The Monterey Barcode Creator always tries to create the shortest barcode. For example, if Monterey Barcode Creator sees that some portion of the data is best fit encoded with Code128 C,it automatically select character set C. The end user does not have the control on how the data is encoded.

8.11.2. Tilde Codes

Under some circumstances, it is necessary to represent some characters with an ASCII-only format. This kind of representation format is called escape sequence. For example, the four special Code128 symbol characters, `FNC1~FNC4`, do not have corresponding ASCII values. Consequently the only way to enter them into the *Message* property is through their escaped forms. Some applications and programming environments may only accept printable ASCII characters, and control characters must be escaped.

Tilde code sequence is the only escape method supported in Monterey Barcode Creator version 3.2 and above. The special character input method (escaping a character using a back-slash character followed by 3-digit character value) present in previous versions is now deprecated.

---

[3]Published in year 2000, this standard is relative new to the industry. Not all scanners in the market support this feature.

The tilde code consequences used in Code128 are listed as below:

~dnnn

When nnn corresponds to a numeric value between 0 and 255, the tilde code sequence represents a character with value equal to nnn. For example, ~d032 represents a space character.

~~

Represents a tilde (~) character.

~1

Represents a `FNC1` character. The tilde escape sequence can appear anywhere in the input.

~2

Represents a `FNC2` character.

~3

Represents a `FNC3` character.

~4

Represents a `FNC4` character. `FNC4` is used to encode extended ASCII characters. You do not need to enter the FNC4 in most circumstances. Just pass the *extended characters* you'd like to encode.

~X

Represents a character value from 0 to 26. Replace the X like in the following example `~@` means character ascii 0, `~A` means character 1, `~B` means character 2, `~C` means character 3 and so on.

Note Due to the fact that each symbology encodes different character set, the tilde code sequence varies from symbology to symbology. Refer to the tilde codes section of each symbology to understand how to escape the character.

8.12. UCC/EAN-128

8.12.1. Introduction

UCC/EAN-128[4] encodes structured data proposed by various industry standard bodies and authorized by GS1 organization. Each data type is identified with a numeric value, called *Application Identifier (AI)*. Multiple AIs and values can be concatenated together into one barcode, such as:

```
(01)19421123450011(15)991231(10)101234
```

The data above contains multiple AIs and values:

- `01` indicates that the value followed `19421123450011` is a SCC-14 number. [5]
- `15` is the AI for Sell by Date. The value followed `991231` indicates that the Sell By Date is December 31, 1999.
- `10` is the AI for Batch Number. According to the specification, it is a variable length AI. Here the value is `101234`.

The AI value determines the meaning and the length of the value part. Many of them encode a predefined length of data. For example, the SCC14 requires exact 14 digits and the Sell By Date requires exact 6 digits in YYMMDD format.

When the data length can be derived from AI, it is not necessary to add field separator (FNC1) in the barcode to separate two adjacent fields. However, if the first field has a variable data length, such a field separator is required. And in many applications it is often desirable to have a field separator between two fixed-length fields. The Code128 symbol character `FNC1` serves this purpose.

8.12.2. How Monterey Barcode Creator Implements UCC/EAN-128

To understand each data field, the Monterey Barcode Creator requires you to enter the data in a special format. The AI must be enclosed with parentheses. From the AI, Monterey Barcode Creator knows whether a field has a fixed length or a variable length. For all variable-length fields, Monterey Barcode Creator inserts field separator unless it is located at the end of the symbol.

The Monterey Barcode Creator also performs data validation on the AI and the data, if the AI is known to the program.

Table 8.4. List of Known AIs

AI	Name	Constraint	Short Name
00	SSCC (Serial Shipping Container Code)	n2+n18	SSCC
01	Global Trade Item Number	n2+n14	GTIN
02	GTIN of Trade Items Contained in a logistic unit	n2+n14	CONTENT
10	Batch or lot number	n2+an..20	BATCH/LOT
11	Production date (YYMMDD)	n2+n6	PROD DATE
12	Due date (YYMMDD)	n2+n6	DUE DATE
13	Packaging date (YYMMDD)	n2+n6	PACK DATE
15	Best before date (YYMMDD)	n2+n6	BEST BEFORE or SELL BY
17	Expiration date (YYMMDD)	n2+n6	USE BY OR EXPIRY

[4] As UCC/EAN orgnization changed its name to *GS1*, now the symbology is also called as GS1-128.

AI	Name	Constraint	Short Name
20	Product variant	n2+n2	VARIANT
21	Serial number	n2+an..20	SERIAL
22	Secondary data for specific health industry products	n2+an..29	QTY/DATE/BATCH
240	Additional product identification assigned by the manufacturer	n3+an..30	ADDITIONAL ID
241	Customer part number	n3+an..30	CUST. PART NO.
242	Made-to-Order Variation Number	n2+n..6	Variation Number
250	Secondary serial number	n3+an..30	SECONDARY SERIAL
251	Reference to source entity	n3+an..30	REF. TO SOURCE
253	Global Document Type Identifier	n3+n13+n..17	DOC. ID
254	GLN Extension component	n3+an..20	GLN EXTENSION
30	Variable count	n2+n..8	VAR. COUNT
310n-369n	(Trade and logistic measurements)	n4+n6	--
337n	Kilograms per square metre	n4+n6	KG PER m2
37	Count of trade items contained in a logistic unit	n2+n..8	COUNT
390(n)	Amount payable - single monetary area	n4+n..15	AMOUNT
391(n)	Amount payable - with ISO currency code	n4+n3+n..15	AMOUNT
392(n)	Amount payable for a Variable Measure Trade Item - single monetary unit	n4+n..15	PRICE
393(n)	Amount payable for a Variable Measure Trade Item - with ISO currency code	n4+n3+n..15	PRICE
400	Customer's purchase order number	n3+an..30	ORDER NUMBER
401	Consignment number	n3+an..30	CONSIGNMENT
402	Shipment Identification Number	n3+n17	SHIPMENT NO.
403	Routing code	n3+an..30	ROUTE
410	Ship to - deliver to Global Location Number	n3+n13	SHIP TO LOC
411	Bill to - invoice to Global Location Number	n3+n13	BILL TO
412	Purchased from Global Location Number	n3+n13	PURCHASE FROM
413	Ship for - deliver for - forward to Global Location Number	n3+n13	SHIP FOR LOC
414	Identification of a physical location Global Location Number	n3+n13	LOC No
415	Global Location Number of the Invoicing Party	n3+n13	PAY

AI	Name	Constraint	Short Name
420	Ship to - deliver to postal code within a single postal authority	n3+an..20	SHIP TO POST
421	Ship to - deliver to postal code with Three-Digit ISO country code	n3+n3+an..9	SHIP TO POST
422	Country of origin of a trade item	n3+n3	ORIGIN
423	Country of initial processing	n3+n3+n..12	COUNTRY - INITIAL PROCESS.
424	Country of processing	n3+n3	COUNTRY - PROCESS.
425	Country of disassembly	n3+n3	COUNTRY - DISASSEMBLY
426	Country covering full process chain	n3+n3	COUNTRY - FULL PROCESS
7001	NATO stock number	n4+n13	NSN
7002	UN/ECE meat carcasses and cuts classification	n4+an..30	MEAT CUT
703(s)	Approval number of processor with ISO country code	n4+n3+an..27	PROCESSOR # s4
7003	Expiration Date and Time	n4+n10	EXPIRY DATE/TIME
8001	Roll products - width, length, core diameter, direction, and splices	n4+n14	DIMENSIONS
8002	Electronic serial identifier for cellular mobile telephones	n4+an..20	CMT No
8003	Global Returnable Asset Identifier	n4+n14+an..16	GRAI
8004	Global Individual Asset Identifier	n4+an..30	GIAI
8005	Price per unit of measure	n4+n6	PRICE PER UNIT
8006	Identification of the component of a trade item	n4+n14+n2+n2	GCTIN
8007	International Bank Account Number	n4+an..30	IBAN
8008	Date and time of production	n4+n8+n..4	PROD TIME
8018	Global Service Relation Number	n4+n18	GSRN
8020	Payment Slip Reference Number	n4+an..25	REF No
8100	GS1-128 Coupon Extended Code - NSC + Offer Code	n4+n1+n5	-
8101	GS1-128 Coupon Extended Code - NSC + Offer Code + end of offer code	n4+n1+n5+n4	-
8102	GS1-128 Coupon Extended Code - NSC	n4+n1+n1	-
90	Information mutually agreed between trading partners (including FACT DIs)	n2+an..30	INTERNAL
91-99	Company internal information	n2+an..30	INTERNAL

If the AI is not listed in the table above [6], Barcode Creator can not know whether its data length is fixed or variable. Thus, the Monterey Barcode Creator treats the data as if its data length is variable and insert the field separator `FNC1` when this field does not end the symbol.

For example, suppose that you set *Message* to `(01) 19421123450011(8019)123456(15)051210`. The Monterey Barcode Creator understands that 01 AI requires fixed-length 14 digits data and AI 15 requires fixed-length 14 digits data. However, Monterey Barcode Creator does not understand the AI 8019 and treats this field as if it has a variable length. The Monterey Barcode Creator inserts a field separator at the end of this field (before AI 15).

Assuming that AI 8019 requires a fixed data length, you can tell Monterey Barcode Creator that the field has a fixed data length by appending a tilde character ~ at the end of the field. For example, you can assign the value below:

```
(01)94211234500122(8019)123456~(15)051210
```

When the Monterey Barcode Creator sees the ~, it treats the current field as fixed-length.

On the other side, if a known AI has a fixed data length but you'd like to have a field separator at the end of the field, you can do so by adding an exclamation character at the end of field, such as:

```
(01)94211234500122!(8019)123456(15)051210
```

It forces a field separator to appear after the SCC14 number even AI 01 has a fixed data length and the field separator is not required. Sometimes this field separator is desirable because it is easier for the application to parse the input.

See the table below for the comparison among results produced by different inputs. The[GS] is the scanner output for `FNC1` character.

Barcode	Data input/Scanner output
(01)94211234500122(8019)123456(15)051210	(01)94211234500122(8019)123456~(15)051210 0194211234500122801912345615051210
(01)94211234500122(8019)123456(15)051210	(01)94211234500122!(8019)123456(15)051210 0194211234500122[GS]8019123456[GS]15051210
(01)94211234500122(8019)123456(15)051210	(01)94211234500122(8019)123456(15)051210 0194211234500122801912345 6[GS]15051210

8.12.3. Auto Check Digit

Before version 3.6, Monterey Barcode Creator calculates mod10 check digits on SCC-14 and SSCC-18 numbers, but only When the property *UccEanOptionalCheckDigit* is `TRUE`. This behavior has been changed since version 3.6. Now the program calculates mod 10 check digit automatically, regardless the value of UccEanOptionalCheckDigit. This renders this property useless.

[6] This table was updated in version 3.6 to reflect the changes made since the first version came out.

Barcode Creator performs check digit calculation on those AIs: 00, 01, 02, 410, 411, 412, 413, 414, 415, and 8018.

8.12.4. Input Format

To create the barcode correctly, you must enclose the AI with parentheses ( ). The Monterey Barcode Creator only accepts numeric AI values. It reports an error when encountering a non-numeric character in the AI part. If AI does not appear in the known list (see the table above), and you do not want the data treated as variable length, you should tell so by appending a tilde character at the end of the field.

Sometimes, it is desirable to have the data separated by spaces in the human readable text. For example, you may like to see the human readable text (8101) 0 54321 1200(21)123456 instead of (8101)0543211200(21)123456. You can create the desirable human readable text by entering the *message* exactly like the one you'd like the human readable to be. Monterey Barcode Creator ignores the spaces during the encoding, but preserves them in the human readable text, as the one below illustrates:

8.12.5. Validation

Monterey Barcode Creator performs the following validations during the encoding process:

- Check whether the AI is numeric.
- Check whether a data part follows the AI.
- If the AI is known to Monterey Barcode Creator and requires a fixed length of data part, check if the data part has the correct length.
- Check whether the AI is enclosed with parentheses.
- If the AI is known to Monterey Barcode Creator and requires only numeric or alpha-numeric data, check if the data part meets the requirement.
- If the AI is known to Monterey Barcode Creator and requires variable length of the data, check if the length of the data exceeds the maximum size allowed.

8.12.6. Non-standard Application

If your application does not pass the validation, you can not use UCC/EAN-128 to encode the data. Nevertheless, since UCC/EAN-128 encoding is based on Code128 symbology, you can encode the data directly with Code128. Here are several hints you may consider when converting the EAN-128 data into a Code128 input:

- An EAN-128 barcode starts with a FNC1 character. FNC1 can be entered with tilde code sequence ~1.
- If you'd like to have the field separator encoded between two adjacent fields, using FNC1 character to separate two fields.
- Code128 is capable of encoding spaces. Do not enter spaces in the input if you do not want them appear in the barcode.
- You may use tilde code sequences to enter extended ASCII characters. See Section 8.11, “Code 128” for details.

For example, Code128 with message **~1810105432112002112345 6** produces the exact barcode as the one using UCC/EAN-128 with message **(8101)0 54321 1200(21)123456**.

Some non-standard applications do not encode the `FNC1` in the starting message. When this is the case, remove ~1 at the beginning of the input.

8.13. Interleaved 2 of 5 (ITF25)

Interleaved 2 of 5 is a high-density numeric symbology. Some applications require a modulo 10 checksum digit at the end of the message. Interleaved 2 of 5 uses an “interwinded” method to create barcodes and consequently it requires the data length to be even. In order to meet this requirement, Barcode Creator appends a MOD10 check digit when it finds that the input is in odd length. Otherwise, it encodes the data as is.

Note that this behavior has changed since version 3.6. Previously, check digit is added only when property *I2of5OptionalCheckDigit* is `TRUE`, otherwise a '0' is appended instead. The new implement allows you to enter 13 digits SCC-14 number to get a complete barcode with the check digit.

If the check digit is added, it always appears in the human readable text.

The input for Interleaved 2 of 5 allow spaces. The spaces are preserved in the human readable text but not encoded into the barcode. Fro example, the barcode below is created on input `0 07 70007 0723`. Note that the last digit '9' is the check digit, which is calculated by the program.

Interleaved 2 of 5 is widely used to encode Shipping Container Code (SCC-14), which contains exact 14 digits. When it is used for encoding SCC-14 numbers, it is also called *ITF-14*.

You can add bear bars to the barcode by setting *BearerBars* to `TRUE`.

8.14. POSTNET

POSTNET (Postal Numeric Encoding Technique) encodes a US numeric address code (also called Zip code) which may contain 5, 9 or 11 digits - frequently referred as *Zip*, *Zip*+4 and *Zip+6*.

POSTNET is a height-modulated symbology which encodes the data in the height of the barcode instead of the width. Monterey Barcode Creator produces POSTNET barcode based on *USPS* standard. The height of each bar and the *pitch* between two adjacent bars are fixed and can not be modified. Changing *NarrowBarWidth* and *BarHeight* yields no effect. Although Monterey Barcode Creator produces human readable if you desire, keep in mind that *USPS* standard does not allow human readable text under the barcode.

The Monterey Barcode Creator accepts non-numeric input but filters them out at the time of the encoding. It adjusts the length by adding trailing zeros to meet the length requirement. You may take the advantage by assigning the full address line to the *Message* instead of passing only digits. For example, data input **`Monterey Park, CA 91755-1688`** yields an identical barcode as message **`917551688`**.

Chapter 9. Technical Support

Morovia offers a wide variety of support services. To help you save time and money when you encounter a problem, we suggest you try to resolve the problem by following the options below in the order shown.

- Consult the documentation. The quickest answer to many questions can be found in the Morovia product documentation.
- Review the tutorial and sample applications. The tutorial steps you through the development process for a typical barcode application. The sample applications provide working code examples in several programming languages. All sample applications are extensively commented.
- Access Morovia Online. Morovia Online provides a knowledge base which documents the frequently asked questions and a web forum.

  The web address for knowledge base is http://support.morovia.com. You can ask question at support forum at http://forum.morovia.com.
- Contact Morovia Technical Support Service. The Technical Support service is provided for free up to 180 days after the purchase. Email Morovia support engineers at `support@morovia.com`.

Note If you purchased your software from our reseller, check to see if they provide support services before contacting Morovia.

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Glossary

AIM	Abbreviation for AIM International, a world-wide trade organization for manufacturers and providers of bar code products, services and supplies.
ASCII	The character set and code described in American National Standard Code for Information Interchange, ANSI X3.4-1977. Each ASCII character is encoded with seven bits.
BMP	BMP is a raster graphics format developed by Microsoft. BMP is the native grahpics format for Windows users. A BMP image data can be uncompressed, or compressed using RLE scheme. The file size is generally much bigger than other types since the compression scheme is not very effective.
Check character	Synonymous to “Check digit”.
Check digit	A character whose value is calculated based on certain algorithm and used for the purpose of performing a mathematical check to ensure the accuracy of the data. In many symbologies this character has a numeric value hence the name.
Code 39	Code 39 (also known as USS Code 39, Code 3 of 9) is the first alpha-numeric symbology developed to be used in non-retail environment. It is widely used to code alphanumeric information, such as the model number etc. It is designed to encode 26 upper case letters, 10 digits and 7 special characters.
Code 93	Code 93 is a discrete, variable length, self-checking symbology. It is derived from Code 39 with major enhancements. Code93 encodes all 127 ASCII characters and does not require special scanner configuration.
EAN-13	EAN is designed by the International Article Numbering Association (EAN) in Europe. It is an extension to UPC-A to include the country information. EAN-13 encodes 12 digits of numeric data along with a trailing check digit, for a total of 13 digits of barcode data.
EAN-8	EAN-8 is the short version of EAN-13, the same as UPC-E vs. UPC-A. An EAN-8 number contains 7 digits of message plus 1 check digit. Different from UPC-E, an EAN-8 number is allocated separately and can not be derived from an EAN-13 number.
EMF	Acronym for Enhanced MetaFile. A newer 32-bit version of Windows MetaFile. EMF contains frame information and contain more drawing commands then its predecessor, WMF.
Extended character	A character other than a 7-bit ASCII character. An extended character is a 1-byte code point with the eighth bit set (ordinal 128 through 255).
GIF	Acronym for Graphics Interchange Format. GIF is a bitmap image format encoding up to 256 distinct color in a 24-bit RGB color space. GIF employs LZW data compression, which does not lose image data during the compression process.

GS1	Organization that oversees the allocation of U.P.C. and EAN numbers. Formerly known as Uniform Code Council (UCC).
GTIN	Acronym for Global Trade Item Number. A 14-digit number that uniquely identifies a trade item.
HIBC	Acronym for Health Industry Bar Code. A bar code format based on code 3 of 9 adopted by health industry.
JPEG	JPEG stands for Joint Photographic Experts Group. It is commonly referred as an image format.
PNG	Acronym for Portable Network Graphics. PNG is a bitmap image format that employs lossless data compression.
POSTNET	POSTNET (Postal Numeric Encoding Technique) encodes a US numeric address code (also called Zip code) which may contain 5, 9 or 11 digits - often called *Zip*, *Zip*+4 and *Zip+6*.
Start/Stop character	A special bar/space pattern that provides the scanner with start and stop reading instructions as well as scanning direction indicator. Most linear symbologies require start/stop characters included in the barcode.
TIF	Acronym for Tagged Image File Format. Also abbreviated as TIFF. TIF is a bitmap image format capable of storing multiple images. It is widely used in scanning, faxing and word processing.
UCC/EAN-128	UCC/EAN-128 was developed to provide a worldwide standard for exchanging data between different companies. UCC/EAN-128 provides a method of defining the meaning of the data through a list of "Application Identifiers" a.k.a. AIs.
UPC-A	The UPC-A barcode is the most common and well-known symbology in North America. UPC-A encodes 11 digits of numeric data along with a trailing check digit, for a total of 12 digits of barcode data.
UPC-E	The UPC-E barcode is the short form representation of a UPC-A number. It reduces the data length from 12 digits to 6 digits by compressing extra zeros.
USPS	Abbreviation for U.S. Postal Service.
WMF	Acronym for Windows Metafile. WMF is a graphics file format on Microsoft Windows. WMF is a vector graphics format which stores drawing commands instead of color information of pixels.

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