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Seagate Crystal Reports

Adding Barcodes to Reports

Overview

This document is intended to provide you with an overview of barcodes, how barcodes work in the Crystal Reports report designer and Seagate Info report designer, and the different types of barcodes available. You can use barcodes in CR version 4 and higher, and in SI version 5 and higher.

The following information can be found in this document:

- Explaining Barcodes and Using barcodes in Crystal Reports (CR) and Seagate Info (SI)
- Using barcode creation functions and the barcodes user function library
- Frequently Asked Questions when using Barcodes

Contents

Introduction - What is a barcode?

A barcode is a series of vertical black and white stripes that can be read by a barcode scanner. The vertical black and white lines contain all the information about that product, such as price, weight, and size. Once it has been scanned, it is translated and often printed out onto a receipt. Rather than having a teller at a store input a long 20-digit number for every item that passes through their checkout counter, barcodes were created as a quick, easy, inexpensive alternative.

Because of the unique needs and demands of various industries, there are a few different types of barcodes that are used.

For example, UPC symbols are used on, but not limited to, CDs, grocery items, and magazines while Code 39 is used in video rental stores, on ID cards, and for labels. Code 128 is a code made up of symbols used often by the shipping industry.

NOTE	Listed in this document are only a few of the most frequently used barcodes.

The following diagrams are sample barcodes:

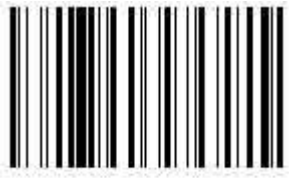
Code 39

Code 39

UPC

UPC

Code 128



POSTNET

Interleaved 2 of 5

Using barcodes

In order to create barcodes you must first purchase the barcode fonts from a company such as Azalea. Once you have installed the fonts from Azalea following their instructions, you will need to download the most recent barcodes User Function Library (U2lbcodeb4a.zip) from Azalea's website at the following location:

http://www.azalea.com

Once you have successfully downloaded the file, you will need to extract the contents to the following locations:

Barcode.dll

- For WINNT systems, extract barcode.dll to c:\winnt\system32
- For Win9x systems, extract barcode.dll to c:\windows\system32

U2lbcode.dll

- For WINNT systems, extract barcode.dll to c:\winnt\crystal
- For Win9x systems, extract barcode.dll to c:\windows\crystal

Creating barcodes in the Seagate Info Report Designer is the same as creating barcodes in the Crystal Reports Report Designer. The same steps apply in both report tools.

To verify the barcode User Function Library (UFL) has been successfully installed, complete the following:

1. Launch Crystal Reports Report Designer or the Seagate Info Report Designer.
2. From 'Insert', select 'Field Object' to launch the 'Field Explorer'.
3. Select 'Formula Fields', and click the 'New' Icon.
4. Type a test name. For example, Test. This will launch the Crystal Reports Formula Editor.
5. In the Formula Editor, you will notice the Barcode fonts available in 'Additional Functions'.

NOTE	You can obtain the most up-to-date barcode fonts from Azalea at http://www.azalea.com

Now that you have installed the UFL, you can create barcodes in CR or SI.

Barcode creation functions and UFLs

Crystal Reports uses the barcode UFL to display barcodes in a report. In the following sections, you will find examples of barcodes and methods to be applied to all barcode functions in CR.

BarcodeC39 (Alphanumeric String)

BarcodeC39() is a function available in CR that displays standard "Code39" barcodes. Code 39 is an industry standard barcode as defined in the American National Standards Institute (ANSI). This barcode is used as the standard for many government institutions. The arguments that are accepted by this function can contain the numbers 0-9, the letters A-Z, both uppercase and lowercase, to a maximum formula output of 254 characters. The formula in this section returns a value that 'Code 39' can understand when scanned.

In order to create Code 39, first create a formula in CR and then apply the applicable barcode font. To create the formula, complete the following steps:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula Fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, BarcodeC39.
4. Type the following into the CR formula editor:

```
//To create Barcode C39

BarcodeC39("ABC123ab")
```

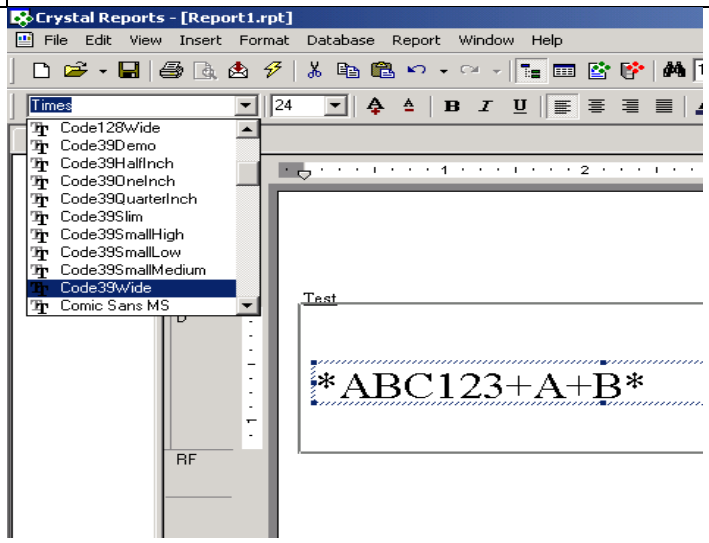
5. Save and close the formula.

6. Insert @BarcodeC39 into the report designer.

You notice that the following syntax is viewed in the formula field that has been inserted into the report:

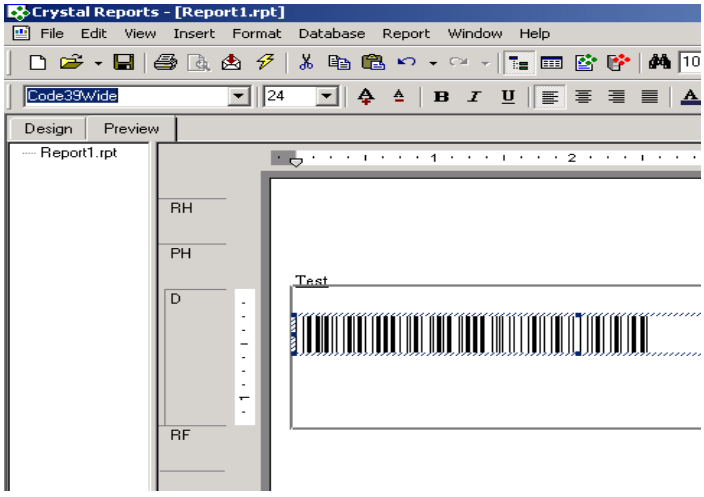
ABC123+A+B

NOTE	Notice the delimiter characters at the beginning and at the end of the barcode syntax. These delimiters tell the barcode scanner where the start and end of the barcode is.



7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field. For example, you may choose Code 39 Wide.

Once you have applied the barcode font to the formula field, you will see the barcode such as the example displayed in the following diagram:



Using a barcode scanner, the barcode will return a value of ABC123abc.

For more information on this code, please go to http://www.mecsw.com/specs/code_39.html

BarcodeI2of5 (Numeric String)

BarcodeI2of5() is a function in Crystal Reports which displays “Interleaved 2 of 5” barcodes. It is applied mainly in industrial and warehouse industries. The numeric string arguments that are accepted can contain only the numbers 0-9. The string should also be an even length, if it is not an even length the function pads an extra zero at the beginning of the code to make it an even length. The formula in this section returns a value that ‘Interleaved 2 of 5’ can understand when scanned.

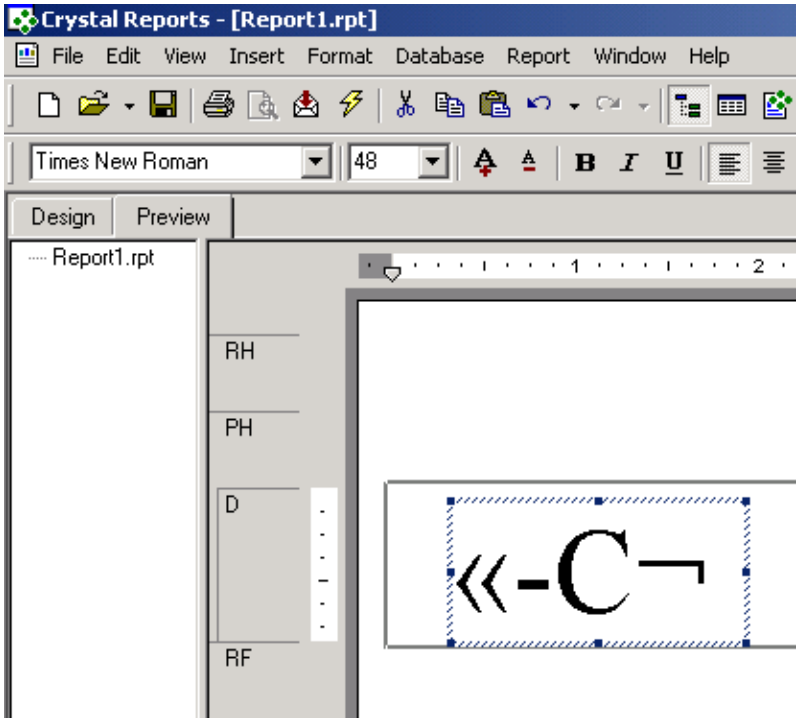
In order to create barcode Interleaved 2 of 5, first create a formula in CR and then apply the applicable barcode font. To create this formula, complete the following steps:

1. From ‘Insert’, click ‘Field Object’. This launches the field explorer.
2. Select ‘Formula Fields’, click the ‘New’ icon.
3. Type a name into the ‘Formula Field’ box. For example, BarcodeI2of5.
4. Type the following into the CR formula editor:

```
//To create Barcode Interleaved 2 of 5
BarcodeI2of5(“1234”)
```

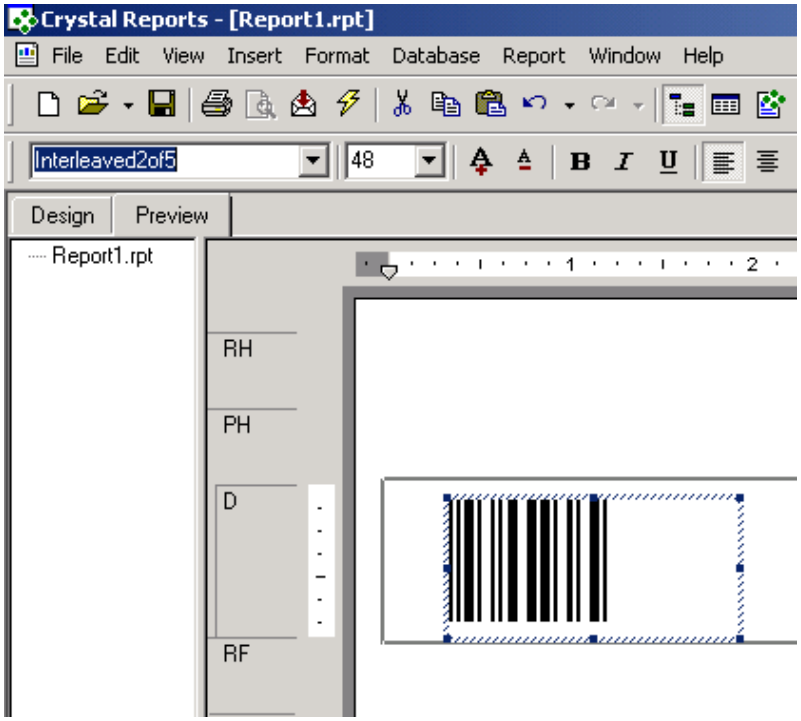
5. Save and close the formula.
6. Insert @BarcodeI2of5 into the report designer.

You notice that the following syntax is viewed in the formula field that has been inserted into the report:



7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field. For example, you may choose Interleaved2of5.

When the font is applied, then the formula will look like the following:



Using the barcode scanner, the barcode will return a value of 1234.

For more information on this code, please go to http://www.mecsw.com/specs/i2_of_5.html

BarcodeC128[A,B, (Alphanumeric String)], [C, (Numeric String)]

"Code 128" is becoming a widely selected barcode due to it's density for numeric data, and its wide selection of characters. Automatic Identification Manufacturers (AIM) maintains this barcode. To find out more about AIM, click on the following link:

http://www.aimi.org/

"Code 128" is divided into three subsets; A, B and C.

All three Code 128 barcode functions use the same syntax. The difference between these three codes is in which characters each code supports, and how each code calculates the checksum at the end of the code.

- "Code 128 A" supports the standard ASCII symbols, digits, upper case characters and other code 128 control codes.
- "Code 128 B" supports standard ASCII symbols, digits, upper and lower case letters.

- "Code 128 C" compresses two numeric digits so that the total length of the barcode is half the length of the other two barcode subsets.

The formula in this section returns a value that 'Code 128' can understand when scanned.

In order to create barcode Interleaved 2 of 5, first create a formula in CR and then apply the applicable barcode font. To create this formula, complete the following steps:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula Fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, BarcodeC128A.
4. Type the following into the CR formula editor:

   ```
   //To create Barcode BarcodeC128A

   BarcodeC128A("A.234")
   ```

5. Save and close the formula.
6. Insert @BarcodeC128A into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field. For example, you may choose Interleaved2of5.

To create a similar formula for BarcodeC128B or BarcodeC128C, complete steps 1 through 7.

For example:

```
BarcodeC128A("A.234")
```

Using the barcode scanner, the barcode will return a value of "A.234".

```
BarcodeC128B("123ABCa")
```

Using the barcode scanner, the barcode will return a value of "123ABCa".

```
BarcodeC128C("4567")
```

Once you have applied the barcode font to the formula field, you will see the barcode.

Using the barcode scanner, the barcode will return a value of "4567".

For more information on this code, please go to
http://www.mecsw.com/specs/code_128.html

BarcodeEAN13 (Numeric String)

BarcodeEAN13() is a function in CR that displays "EAN-13" barcodes. "EAN-13" is a widely used barcode for marketing retail goods. It also supports the addition of 2 digit and 5 digit supplemental barcodes. The formula in this section returns a value that 'EAN-13' can understand when scanned. The syntax to display this code is as follows:

To create BarcodeEAN13, you must create a formula in CR, and then apply the applicable barcode font. To create this formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, BarcodeEAN13.
4. type the following into the CR formula editor:

```
//To create BarcodeEAN13

BarcodeEAN13("8910235689740")
```

5. Save and close the formula.
6. Insert @BarcodeEAN13 into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode.

Using the barcode scanner, the barcode will return a value of "8910235689740".

For more information on this code, please go to
http://www.mecsw.com/specs/ean_13.html

BarcodeEAN8 (Numeric String)

BarcodeEAN8() is a barcodes function in Crystal Reports that displays "EAN-8" barcodes. "EAN-8" is used the same way as "EAN13". EAN8 is a shortened version of the EAN13 code. The code itself is broken into 3 parts. They are a 2-digit country code, 5 data digits, and a checksum digit. As in EAN13 a 2-digit and 5-digit extension can be added to the end of the code. The formula in this section returns a value that 'EAN-8' can understand when scanned.

In order to create BarcodeEAN8, first create a formula in CR, and then apply the applicable barcode font. To create a formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, BarcodeEAN8.
4. Type the following into the CR formula editor:

```
//To create BarcodeEAN8

BarcodeEAN8("89102356")
```

5. Save and close the formula.

6. Insert @BarcodeEAN8 into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode.

Using the barcode scanner, the barcode will return a value of "89102356".

For more information on this code, please go to http://www.mecsw.com/specs/ean_8.html

BarcodeUPCA (Number System, Item, Manufacturer)

BarcodeUPCA() is a function in CR that displays UPCA barcodes. These barcodes are generally used on products sold at the retail level to the public. The barcode returns the manufacturers name and the specific product to produce a calculation of price for that product. The formula in this section returns a value that 'UPCA' can understand when scanned.

In order to create BarcodeUPCA, first create a formula in CR, and then apply the applicable barcode font. To create this formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, BarcodeUPCA.
4. type the following into the CR formula editor:

```
//To create BarcodeUPCA

BarcodeUPCA("0", "16143", "13049")
```

5. Save and close the formula.
6. Insert @BarcodeUPCA into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode.

Using the barcode scanner, the barcode will return a value of "01614313049".

For more information on this code, please go to http://www.mecsw.com/specs/upc_a.html

BarcodeUPCE (Compressed UPC String)

BarcodeUPCE() is a function in CR that displays UPCE barcodes. The UPCE code is similar to the UPCA barcode. This code used mainly for labeling small items. The formula in this section returns a value that 'UPCE' can understand when scanned.

In order to create BarcodeUPCE, first create a formula in CR, and then apply the applicable barcode font. To create this formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, BarcodeUPCE.
4. type the following into the CR formula editor:

```
//To create BarcodeUPCE

BarcodeUPCE("649953")
```

5. Save and close the formula.
6. Insert @BarcodeUPCA into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode.

Using the barcode scanner, the barcode will return a value of "06499539".

For more information on this code, please go to
http://www.mecsw.com/specs/upc_e.html

BarcodeBookland (ISBN Number, 5 digit Supplemental)

BarcodeBookland() is a function in CR that displays ISBN barcodes. ISBN stands for 'International Standard Book Number' and is used for labeling books. The formula in this section returns a value that 'ISBN' can understand when scanned.

In order to create BarcodeBookland, first create a formula in CR, and then apply the applicable barcode font. To create this formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, BarcodeBookland.
4. type the following into the CR formula editor:

```
//To create BarcodeBookland

BarcodeBookland("0688123163","9000")
```

5. Save and close the formula.
6. Insert @BarcodeUPCA into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode.

Using the barcode scanner, the barcode will return a value of "9780688123161".

For more information on this code, please go to
http://www.mecsw.com/specs/bookland.html

BarcodePostnet (Zip code)

BarcodePostnet() is a function in CR that displays an American Postal Service barcode. The American Postal Service to automatically sort mail uses this barcode. The formula in this section returns a value that 'EAN13' can understand when scanned.

In order to create BarcodePostnet, first create a formula in CR, and then apply the applicable barcode font. To create a formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, BarcodePostnet.
4. Type the following into the CR formula editor:

NOTE	Only select the BarcodePostnet font applicable to 5, 9, or 11 digit zip codes. Do not type all three formulas into the formula editor. Select only the one that applies to you.

```
//To create BarcodePostnet for 5 digit zip codes

BarcodePostnet("12345")

//To create BarcodePostnet for 9 digit zip codes

BarcodePostnet("123456789"))

//To create BarcodePostnet for 11 digit zip codes

BarcodePostnet("123456789"))
```

5. Save and close the formula.
6. Insert @BarcodePostnet into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode. This function also supports the "-" character.

Using the barcode scanner, the barcode will return the following values:

For 5 digit postal codes, BarcodePostnet(12345) returns:

12345

For 9 digit postal codes, BarcodePostnet("123456789") returns:

123456789

For 11 digit postal codes, BarcodePostnet("12345678901") returns:

12345678901

For more information on this code, please go to
http://www.mecsw.com/specs/postnet.html

NumberToCode39 (number, #places)

NumberToCode39() is a function used in CR that simply converts numbers, which are contained in number fields, into the format that is used to create barcodes. It converts the numbers to the characters supported by the font and then formats the resulting value with leading and trailing asterisks. The formula in this section returns a value that 'NumberToCode39 can understand when scanned.

In order to create NumberToCode39, you must create a formula in CR, and then apply the applicable barcode font. To create this formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, NumberToCode39.
4. type the following into the CR formula editor:

```
//To create NumberToCode39

NumberToCode39(1234567,0)
```

5. Save and close the formula.
6. Insert @NumberToCode39 into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode. This function also supports the "-" character.

Using the barcode scanner, the barcode will return a value of *1234567*.

For example:

```
NumberToCode39(1234567,0)
```

Returns *1234567*.

```
NumberToCode39(1234567.890)
```

Returns *1234568*.

```
NumberToCode39({file.FIELD},0)
```

Returns *1234567*.

An important fact to remember when using this function is that the output of this function will only output the characters '0-9', thus any number with decimals in them will become a rounded whole number. For example, if the input number is (1234567.89,0), the output will be *1234568*.

StringToCode39(String)

StringToCode39() is used in exactly the same way as the NumberToCode39 function except that it applies only to a string or a string field. It is not necessary to convert the string to a number before you use this function as the conversion is done in the function directly. The formula in this section returns a value that 'StringToCode39' can understand when scanned.

In order to create StringToCode39, first create a formula in CR, and then apply the applicable barcode font. To create this formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, StringToCode39.
4. type the following into the CR formula editor:

```
//To create StringToCode39
StringToCode39(1234567_89)
Or
//To create StringToCode39
StringToCode39({file.FIELD},0)
```

5. Save and close the formula.
6. Insert @StringToCode39 into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode.

Using the barcode scanner, the barcode will return the following values:

```
StringToCode39(1234567_89)
```

Returns = *1234567_89*

```
StringToCode39({file.FIELD},0)
```

Returns =*1234567*.

An important difference to note between this function and the NumberToCode39 function is that this function will return the characters 0-9, as well as the underscore character (_) whereas NumberToCode39 returns only the characters 0-9.

NumberToPostnet (Number)

NumberToPostnet() is a formula function in CR used to prepare numbers in number fields for conversion to US mail zip code barcodes. In this function the numbers '0-9' are converted directly. A check digit is also calculated and added to the end of the code. The check digit is calculated is by using a simple formula. This formula calculates the total value of all the digits in the code. The formula in this section returns a value that 'NumberToPostnet' can understand when scanned.

In order to create NumberToPostnet, first create a formula in CR, and then apply the applicable barcode font. To create this formula, complete the following:

1. From 'Insert', click 'Field Object'. This launches the field explorer.
2. Select 'Formula fields', click the 'New' icon.
3. Type a name into the 'Formula Field' box. For example, NumberToPostnet.
4. Type the following into the CR formula editor:

```
//To create NumberToPostnet

NumberToPostnet(981160745)
```

5. Save and close the formula.
6. Insert @NumberToPostnet into the report designer.
7. Select the formula field, choose the barcode font from the drop down list, and apply it to the formula field.

Once you have applied the barcode font to the formula field, you will see the barcode.

Using the barcode scanner, the barcode will return a value of "s9811607459s".

The check digit is the difference between the sum of all digits in the zip code and the next highest round number.

For example, the check digit for the zip code 98116-0745 is 9 because:

9+8+1+1+6+0+7+4+5 = 41, 41 + 9 returns 50.

The number 50 is the next highest round number after 41.

Frequently asked questions on barcodes

These frequently asked questions are organized by type of barcode.

Code 3 of 9

Q: Why doesn't the barcode scan properly (or at all)?

You need have a delimiter character (*) at both the beginning and the end of the string.

For example:

- 23456 or *23456 or 23456* will not scan properly
- *23456* will scan properly

Q: What size does the font have to be to scan properly?

Set the font size to 18 point or more.

Q: Why do boxes show on my report?

The boxes indicate that you have a character in the string that is not supported by the font set that you have been provided with.

Q: Why don't I get the full character set?

Under an agreement with a third party, the sample set of fonts included with Crystal Reports 4.0 consists only of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, _ and * .

To get a full set of letters (upper/lower case), numbers and special characters contact Azalea at http://www.azalea.com/.

Q: Why are the numbers separate from the bars?

The font was designed specifically to enable the user full control over the placement and sizing of the barcode and the corresponding human-readable font.

Q: How do I put a space character in the string?

The space character is represented by an underscore in the string.

For example:

12_25_94 will print the corresponding barcode for 12 25 94.

12 25 94 will print boxes where the spaces are in the string .

Q: What files do I need to include with my runtime application?

You will need to include the UFL file that can be downloaded from either the Crystal Decisions, or Azalea websites, along with any of the barcode fonts that need to be used for distribution.

PostNet

Q: What are the delimiters required for the font?

You must have an "s" at the beginning and the end of the string. You must also have a check digit at the end of the number that is based on the difference between the sum of the numbers and the next highest multiple of 10.

```
For example:
zip code: 92310
calculate check digit:
9+2+3+1+0 = 15
20 - 15 = 5
check digit: 5
Postnet string is: s923105s
```

The above output will properly display a POSTNET barcode when the font on the field is applied.

Human-Readable Font

Q: What is this font used for?

This is used to display the barcode value in a specific font style so people are able to read the barcode value without having to use barcode scanners. Typically, you see this immediately below the barcode.

Finding More Information

The following reference materials were used to create this document. If you want more information on barcodes, it is recommended that you go the following links:

CIA (Barcodes)
Wythenshawe, Manchester, UK

http://ourworld.compuserve.com/homepages/CIA_UK

The Barcode Software Center
1113 Hull Terrace, Evanston, IL 60202 USA

http://www.mecsw.com/

Rivers Edge Cedar Park,
TX, USA

http://www.riversedge.com/

Azalea
Seattle,WA, USA

http://www.azalea.com/

The Azalea Phone # is 1-206-932-6028.

Contacting Crystal Decisions for Technical Support

We recommend that you refer to the product documentation and that you visit our Technical Support web site for more resources.

Self-serve Support:

http://support.crystaldecisions.com/

Email Support:

http://support.crystaldecisions.com/support/answers.asp

Telephone Support:

http://www.crystaldecisions.com/contact/support.asp