eFORMz Mini-Manual

Barcodes

Minisoft® eFORMz™

Version 10.0

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eFORMz 10.0 - January 2014

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IF A CUSTOMER IS PURCHASING AN UPGRADE FOR AN EARLIER VERSION OF THE PRODUCT, THEN THIS AGREEMENT SHALL SUPERSEDE THE TERMS AND CONDITIONS OF THE LICENSE AGREEMENT THAT APPLIED TO THE EARLIER VERSION AS TO THE USE OF THE UPGRADE PRODUCT AS OF THE DATE OF INSTALLATION OF THE UPGRADE.

NOW, THEREFORE, in consideration of the foregoing provisions and the terms and conditions herein contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the following terms and conditions apply:

A. License Grants

1. Upon MINISOFT's receipt from the Customer of the one-time license fee and further subject to the other terms and conditions herein, MINISOFT grants the Customer a non-exclusive and non-transferable perpetual license: (a) to install and use the Product on only one host computer or business server in the Customer's business organization; and (b) to install the client portion of the Product on a network server for access by more than one personal computer and on any personal computer client accessing the host server program.

2. You may not: (a) allow access to or use of the Product to anyone outside of your organization; (b) decompile, reverse engineer, decrypt, disassemble, or otherwise attempt to copy or replicate the source code; (c) modify or translate those portions of the Product that are provided in an object or source code form, or alter, merge, modify, reverse engineer or adapt the Product in any way including disassembling or decompiling; (d) copy, loan, rent, lease or sublicense, assign, convey, sell, mortgage, pledge, dispose or in any other manner transfer to a third-party any part of or all of the Customer's rights and obligations under this Agreement or in the Product; or (e) otherwise copy, distribute, rent, loan, disseminate, publish, sell or transfer any portion of the Product in any way inconsistent with or contrary to the terms and conditions of the Agreement.

3. Any attempt to violate any prohibitions described in this Agreement shall be considered a material breach of this Agreement, and no attempt to violate section 2(c) or 2(d) in the immediately preceding paragraph shall have any effect, and any prohibited act described therein shall be void and of effect if made by the Customer.

4. You may make one copy of the Product for use as a backup copy (the "Copy") provided that: (i) the Copy includes all notices of copyright and all other proprietary rights appearing in and on the Software Product; (ii) the Copy and the original Product are not in use at the SAME time; (iii) Customer establishes a procedure for accounting for the Copy at all times; and (iv) Customer destroys or returns to MINISOFT the Copy when it is no longer required or when the license grants made hereunder are terminated for any reason, whichever occurs first.

5. This Agreement grants to the Customer a license for use of the Product on the terms and conditions set forth in this Agreement; and (ii) the Customer may not install, copy, perform, execute, display, or use in any other fashion the Product except in accordance with the terms and conditions of this Agreement. By any use of any element of the Product, the Customer shall be deemed to have accepted and be bound by all the terms and conditions of this Agreement.

6. MINISOFT retains and reserves all rights to the Product. Nothing contained herein shall be deemed to convey to the Customer any title to, or an ownership interest in, the Product or any of the intellectual property rights contained in the Product. Upon termination of this Agreement, all rights granted to the Customer herein shall automatically revert to MINISOFT.

B. Termination

The license grants made hereunder shall automatically terminate on the date of any breach by the Customer of any of the terms and conditions of this Agreement. In any such termination, you shall discontinue using the Product. You further agree to return the Product to MINISOFT or destroy all components of the Product and to certify in writing that the Product is no longer in use and that you have kept no copies of the Product. In any such termination of the license grants, none of MINISOFT's rights in law or equity shall be barred, discharged, released, or otherwise impaired by such termination, and MINISOFT reserves all such rights described herein.

C. Confidential Information

The Product also contains MINISOFT's commercially valuable, proprietary and confidential information and trade secrets (collectively "Confidential Information"). You are obligated to preserve and hold in confidence any Confidential Information and may not use any of it except in accordance with the terms and conditions of this Agreement. Confidential Information shall not include what is already public at the date of its disclosure or what later becomes lawfully public through no fault or responsibility of the Customer.

D. Limited Warranties and Limitations on Damages and Remedies.

1. Only the limited warranties expressly described in this section are made to the Customer purchasing this Product. No warranty of any kind, whether express or implied, is made to any third-party or other transferee or successor of the Customer.

2. MINISOFT warrants that it has the right to grant the licenses contained in this Agreement.

3. MINISOFT warrants that this product will execute its programming instructions when properly installed on a properly configured computer for which it is intended. MINISOFT makes no warranty of any kind, implied or express, that the Product will meet Customer's requirements or that the Product will be uninterrupted or error-free

4. MINISOFT, Inc. warrants the media upon which this Product is recorded to be free from defects in materials and workmanship under normal use for a period of 90 days from the date of purchase. During the warranty period MINISOFT will replace media that prove to be defective. Customer's exclusive remedy for any media that proves to be defective shall be to return the media to MINISOFT for replacement.

5. MINISOFT' only obligation, liability and/or remedy, with respect to the warranties set forth in this Agreement shall be one of the following, which MINISOFT shall have sole discretion to choose: (1) as described above, to provide replacement media (whether in the form of the current release or otherwise) for the Product; (2) to replace, without charge, the Product with a functionally equivalent software product; or (3) to refund the applicable license fees paid to MINISOFT by Customer.

These are the sole and exclusive remedies for any breach of warranty.

6. MINISOFT shall have no obligation, liability or any other kind of responsibility for the costs of restoring any destroyed or defective data, installation of replacement media, or software conversion work made necessary by replacement media, even if MINISOFT had been specifically informed by Customer of the possibility or probability of any such consequences. During the ninety (90) days warranty period for the media, MINISOFT will replace, without charge, on an exchange basis, any media which is not as warranted. Customer must return the defective item postpaid to MINISOFT, postmarked within the time period stated above. Customer must either insure the defective item being returned or assume the risk of loss or damage in transit. Any claim under the above warranty must include a copy of Customer's receipt or invoice or other proof of the date of delivery.

7. Year 2000 Warranty. MINISOFT warrants that the Product will accurately process date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations, in accordance with the Product's documentation BUT ONLY to the extent that other technology and systems (e.g., software and operating systems, hardware and firmware) used in combination with the Product properly exchanges date/time data with it. In addition to the limitations of liability and remedies described above in this Section, the Year 2000 warranty made herein is made only for ninety (90) days after the date of delivery of the Product and only if any noncompliance is discovered and made known to MINISOFT in writing within such ninety (90) days. The Year 2000 warranty expires after such ninety (90) day period and shall not extend to any events occurring after the expiration date.

8. MINISOFT makes no other warranty, expressed or implied, with respect to the Product.

9. NOTICE: THE WARRANTIES, OBLIGATIONS AND LIABILITY OF MINISOFT AND THE RIGHTS AND REMEDIES OF CUSTOMER SPECIFICALLY SET FORTH IN THIS AGREEMENT ARE THE CUSTOMER'S EXCLUSIVE REMEDIES. MINISOFT DISCLAIMS, AND CUSTOMER HEREBY WAIVES, DISCHARGES AND RELEASES MINISOFT, ITS OFFICERS, DIRECTORS, EMPLOYEES AND AGENTS, FROM ANY AND ALL (1) OTHER WARRANTIES, OBLIGATIONS, OR LIABILITIES AND (2) RIGHTS, CLAIMS, CAUSES OF ACTIONS, EXPRESS OR IMPLIED, ARISING BY LAW OR OTHERWISE IN CONNECTION WITH, REGARDING, OR ARISING FROM THE PRODUCT OR ANY RELATED SOFTWARE, TANGIBLE OR INTANGIBLE ITEMS OR SERVICES PROVIDED UNDER THE AGREEMENT (INCLUDING, WITHOUT LIMITATION, ALL DOCUMENTATION SUPPLIED WITH THE PRODUCT). THE WAIVER, DISCHARGE AND RELEASE INCLUDE, BUT ARE NOT LIMITED TO: (1) ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A SPECIFIC PURPOSE; (2) ANY IMPLIED WARRANTY ARISING FROM COURSE OF PERFORMANCE, COURSE OF DEALING, OR USAGE OF TRADE; AND (3) ANY OBLIGATION, LIABILITY, RIGHT, CLAIM, OR REMEDY, WHETHER IN TORT, CONTRACT, OR OTHERWISE. IN NO CASE SHALL MINISOFT BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF USE, REVENUE, PROFIT, OR DATA), PUNITIVE DAMAGES, EXEMPLARY OR OTHER STATUTORY DAMAGES, EXPENSES, COSTS (INCLUDING ATTORNEY FEES). IN ADDITION, IN NO CASE SHALL MINISOFT'S LIABILITY EXCEED THE FEES PAID BY CUSTOMER FOR THE PRODUCT.

E. Updates

Customer is entitled to updates and enhancements to licensed software if under a current Minisoft software update and subscription service. The cost of the update and subscription service will be 20% of the purchase price of the licensed software. The update and subscription service is for twelve (12) months and can be renewed at the customer's discretion.

F. Support Services

A customer that has purchased annual support entitles them to any and all software updates for their licensed product(s) as well as technical support via phone and email. Software Updates are available from our web site, www.minisoft.com. Included with the purchase of support is the use of our Toll Free 800 number, and support email. Days and Hours of support coverage are Monday through Friday 7:30am (Pacific) until 5:00pm (Pacific). When support is purchased or renewed, an update may be downloaded from the Minisoft Website. In cases where support has expired, back-support is charged to bring the support account current. Any supplemental software code provided to you as part of the Support Services shall be considered part of the SOFTWARE PRODUCT and subject to the terms and conditions of this License Agreement.

G. Miscellaneous

1. Governing Law. This Agreement is made for the sole benefit of the parties hereto, and there are no third party beneficiaries to this Agreement. This Agreement shall be interpreted under the laws of the State of Washington, notwithstanding the application of any jurisdiction's choice-of-law rules to the contrary.

2. Independent Contractors. No agency, partnership, joint venture, or employer-employee relationship is created hereby, and neither party nor any of its agents or employees shall have any authority of any kind to bind the other party in any respect whatsoever. Each party is an independent contractor to the other party.

3. No Assignment by Customer. This Agreement shall be binding upon and inure to the benefit of MINISOFT and any successors and assigns. Customer shall have no right to assign or otherwise transfer its rights or obligations under this Agreement except with the prior written consent of MINISOFT, which MINISOFT in its sole discretion and for any reason or no reason provide or withhold.

4. Entire Agreement. This Agreement contains the complete understanding between the parties and shall as of the date the Product is first installed supersede all other agreements, whether they are written or oral, between the parties concerning the particular subject matter. The language of this Agreement shall for all purposes be construed as a whole, according to its fair meaning, not strictly for or against either party, and without regard to the identity or status of any person who drafted all or any part of it. No purchase order or any other purchasing instruments issued by Customer, even if such purchase order or other purchasing instrument provides that it takes precedence over any other agreement between the parties, shall be effective to contradict, modify, delete from or add to the terms of this agreement in any manner whatsoever.

5. Severability. In the event that any one or more provisions of this Agreement is found by a court of competent jurisdiction to be unenforceable or invalid, then notwithstanding any such finding the remainder of this Agreement shall remain in full force and effect, and such provision that is found to be unenforceable or invalid shall be deemed severed.

6. Waiver. Neither party's right to require performance of the other party's obligations hereunder shall be affected by any previous waiver, forbearance, or course of dealing, nor shall any waiver or forbearance or other course of dealing at any time with respect to any term or condition in this Agreement be effective unless evidenced in writing signed by the waiving party as to such waiver, forbearance or other course of dealing. No waiver or modification of this Agreement or any covenant, condition or limitation herein contained shall be valid and no evidence of waiver or modification shall be offered or received in evidence in any proceeding, arbitration or litigation between the parties hereto arising out of or affecting this Agreement or the rights or obligations of the parties hereunder, unless such waiver or modification is in writing duly signed by both parties.

7. Headings, Sections - The various headings in this Agreement are inserted for convenience only and shall not affect the meaning or interpretation of this Agreement or any Section or provision hereof.

8. Disputes; jurisdiction and venue. Customer and MINISOFT consent to personal jurisdiction, subject matter jurisdiction, and venue in the state and/or federal courts sitting in King or Snohomish Counties, State of Washington. Any action relating to this Agreement must be brought in the state or federal courts located in King or Snohomish County, Washington.

9. Attorney's Fees. In the event legal action is brought by either party to enforce any of the provisions of this Agreement, the prevailing party shall recover its reasonable attorney's fees, costs, and expenses, including but not limited to fees, costs and expenses of collecting any judgment.

10. Export. The export of this product is restricted by U.S. export regulations.

11. GOVERNMENT RESTRICTED RIGHTS. The Software Product and documentation are provided with restricted rights. Use, duplication or disclosure by the Government is subject to restrictions as set forth in subparagraph (c) (2) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 252. 227-7013 or subparagraphs (c) (1) and (2) of the Commercial Computer Software-Restricted Rights at 48 CFR 52.227-19, as applicable. Contractor/manufacturer is MINISOFT, INC., 1024 FIRST STREET, SNOHOMISH, WASHINGTON, 98290, U.S.A.

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1D Barcodes

1D Barcodes can be created using a custom or system variable. eFORMz supports the following barcode types:

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CODEABAR	EAN13	POSTNET
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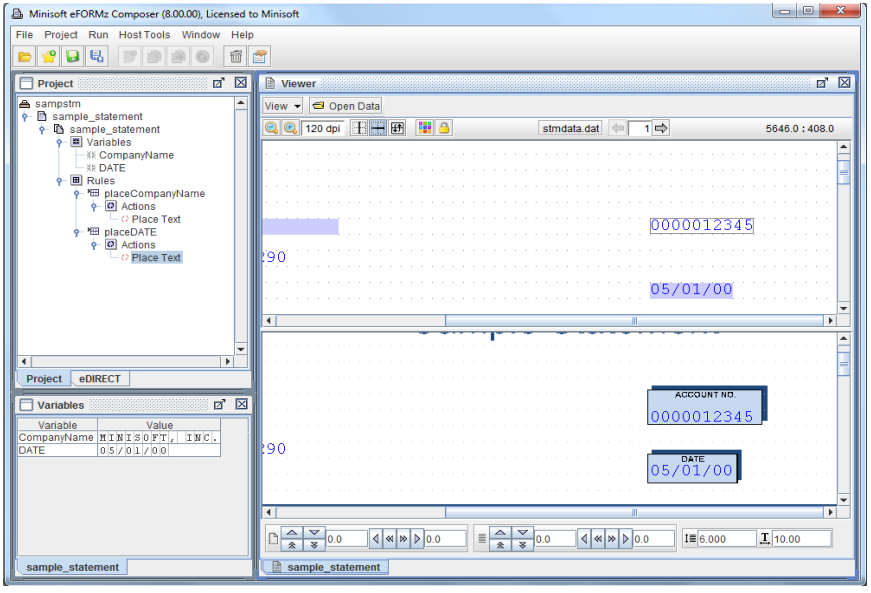
MSI	JAN13	
UPCA	CODE11	

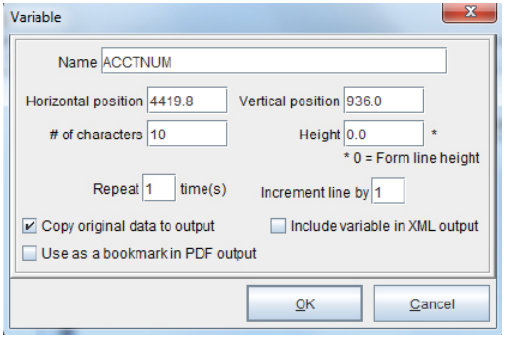
To create a barcode using data from your input file, use the following method:

1. From the Data Viewer highlight the selected range of data you would like to barcode.



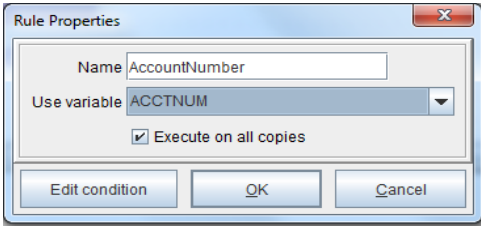
2. *Right click* and select *Add Rule* > *1D Barcode*.

3. From the *Variable* dialog box enter a new variable name and click *OK*:



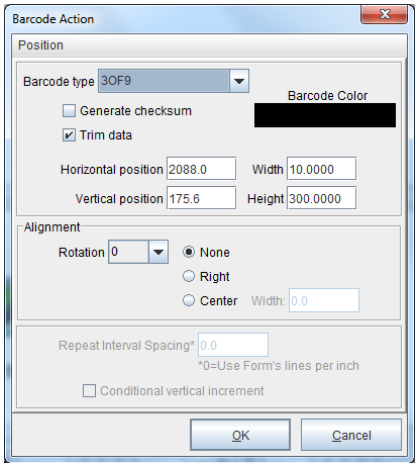
> ***TIP***: If you would like the original data to appear in its original position select *Copy original data to output*.

4. The *Rules* dialog box displays. Enter a new rule name and click *OK*.



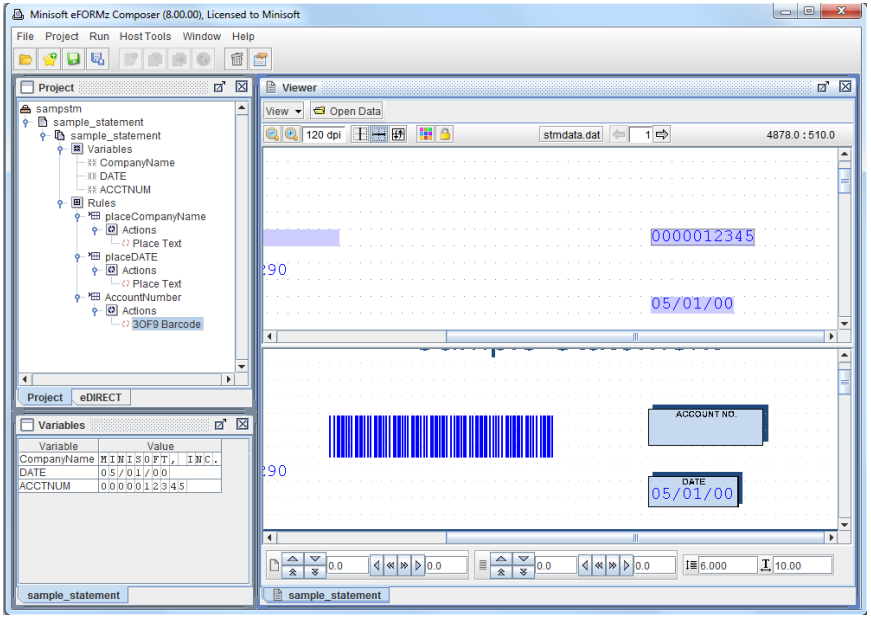
5. From the *Barcode Action* dialog box, select the barcode type along with the desired width and height. Default values are:

   width = 10 height = 300.0



   Once your barcode specifications have been set click *OK*.

6. The newly created barcode will appear in your eFORMz Viewer:

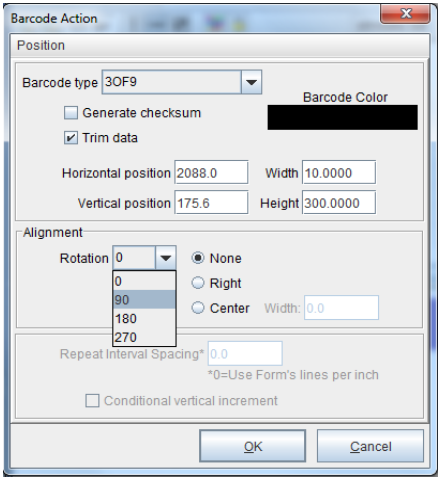


   If the barcode is not in the exact position you would like it to be, using your mouse, click-and-drag the barcode into place.

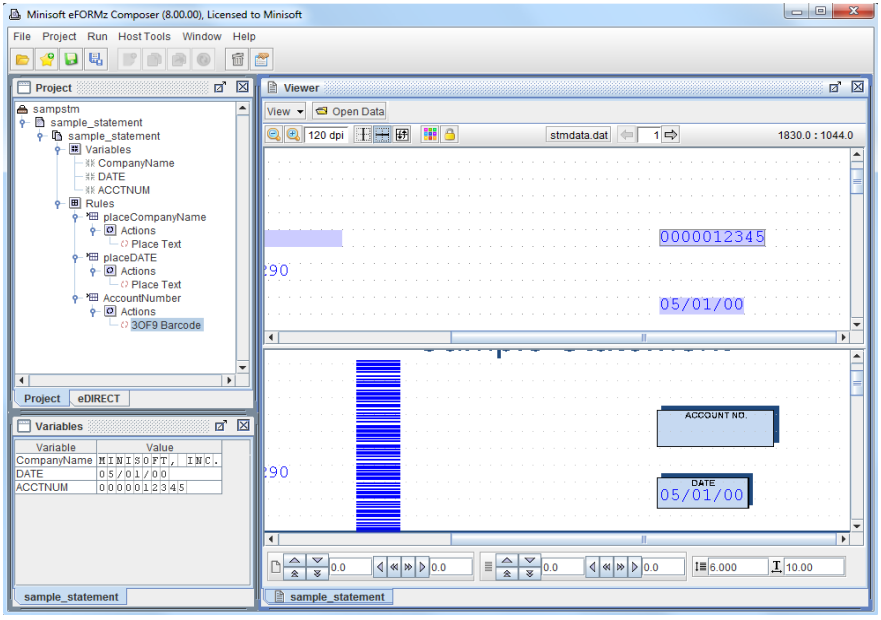
Barcode Rotation

To rotate a barcode:

1. From the *Barcode Action* dialog box, select the rotation angle from the *Alignment* > *Rotation* field. Options available are 0, 90, 180, and 270.



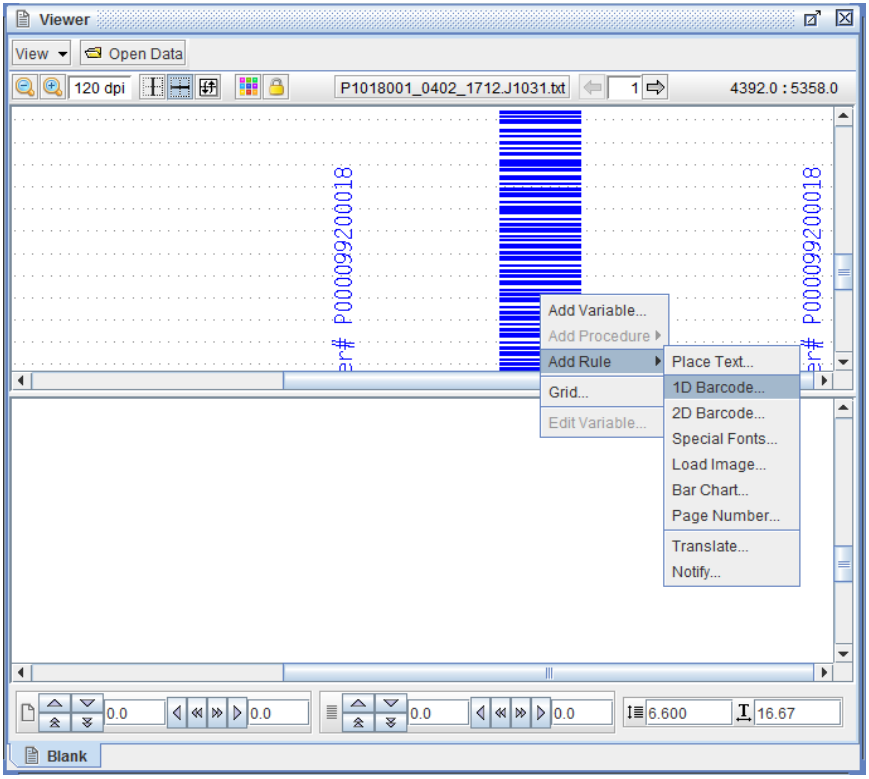
2. Once an angle has been selected, click *OK*. The rotated barcode will now appear in the eFORMz Viewer.



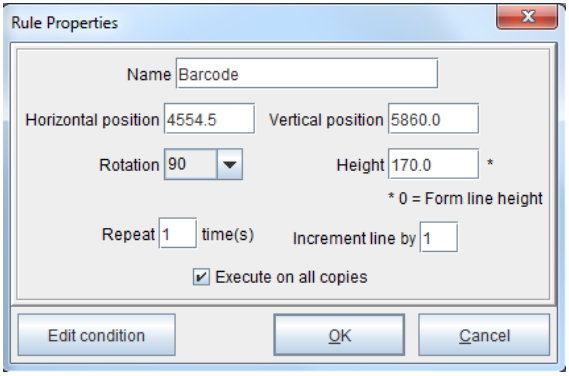
Direct Reference

As with strings of characters, 1D barcodes can be placed directly from the data viewer. All incoming barcodes will appear in the Form Viewer, however, if the barcode needs to be moved or changed in some way, it can be copied by direct reference.

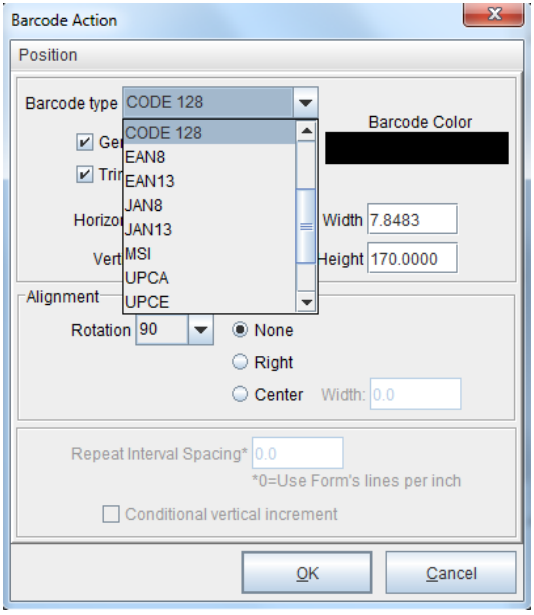
1. From the eFORMz Data Viewer, *right click* the barcode to be placed on the form and select *Add Rule > 1D Barcode.*



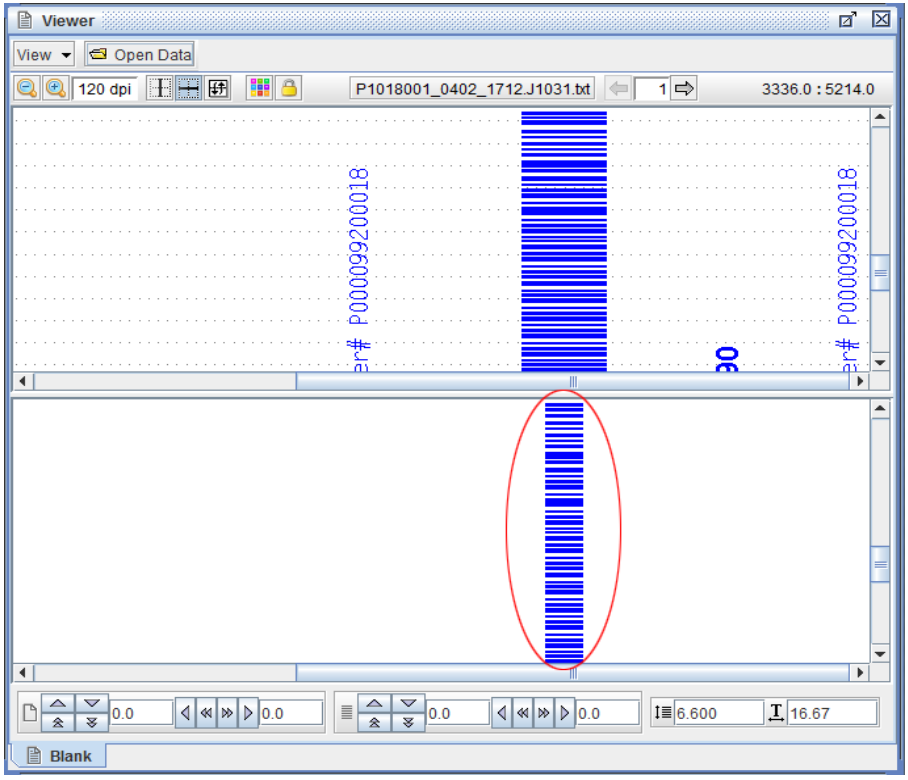
2. The Rule Properties dialog box will display. Enter a value for the *Name* field, and make any adjustments to positioning and size.



3. The Barcode Action dialog box will appear. Select the *Barcode type* and click *OK* to continue.



4. The barcode will be visible in the Form Viewer.



1D Barcode Types

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H-P

Code 39 is an alphanumeric bar code that can encode decimal numbers, the upper case alphabet, and the following special symbols:

- . * $ / % +

Code 39 characters are constructed using nine elements, five bars and four spaces. Of these nine elements, two of the bars and one of the spaces are wider than the rest. Wide elements represent binary ones (1), and narrow elements represent binary zeros (0) corresponding to check character values.

3 of 9 Extended

h-p

Full ASCII Conversion

Extended Code 39 encodes the full 128 character ASCII character set by paring Code 39 characters.

Codabar

Codabar is a discrete, numeric code with special characters and four different start/stop characters. Each character is encoded as seven elements, with two or three of the elements wide. While the Codabar check character is undefined, AIM has a recommended check character.

Data:

0-9 - $:/ . + A B C D

2 of 5

012345

Interleaved 2 of 5 code is a numeric only barcode. Each character of this code is represented by five elements, two wide and three narrow. Wide elements are decoded as binary one (1), and narrow elements are decoded as binary zero (0). The wide to narrow element ratio should be between two and three.

Whether or not the elements used to encode a character are bars or spaces depends upon the location of the character within the message. The first character of the message is encoded into the bars immediately following the start character. The second character of the message is encoded into the spaces between the bars of the first character, thus eliminating the intercharacter space. Because of this, Interleaved 2 of 5 is a continuous barcode.

MSI Code

1230

MSI Code is a numeric, continuous code. Each character consists of four bits, using a straight binary encodation. Each bit is encoded in the following way: if the bit is a 1, the pattern to be used is a wide bar followed by a narrow space. If the bit is to be a 0, the pattern is a narrow bar followed by a wide space.

UPC A

UPC A

Version A encodes a twelve-digit number. The first number encoded is the number system character, the next ten digits are the data characters, and the last digit is the check character.

The number system character is printed in human readable form to the left of the UPC symbol. Seven of the ten possible numbers have been assigned.

UPC E

0 0 1 0 2 5 4

Version E allows zeros to be removed from the data to be encoded, resulting in a shorter tag. The encodation of the data characters is different than Version A.

EAN Codes

EAN 13

The EAN Code encode either 13 or 8 characters. The 13 character version is a superset of the UPC A code. The 8-character version is for printing on smaller packages.

EAN 8

The EAN 8 symbol encodes two flag characters, five data characters, and a check character.

JAN Code

The JAN codes are the same as the EAN codes, with the flag characters set to "49".

Code 11

01234596

Code 11 is a numeric, high-density code with one special character -. Each character is encoded with five elements, either two wide and three narrow, or one wide and four

narrow. The wide elements are a binary one (1), and the narrow elements are a binary zero (0).

Code 128

CODE 128

Code 128 is a continuous, multi-level, full ASCII code. Each of the Code 128 characters consists of three bars and three spaces. The bars and spaces may be one, two, three, or four modules wide. The total length of each code 128 character is eleven modules, with the total length of the bar modules odd, and the total length of the space modules even.

Barcode 128 has three different encoding methods: A, B and C. The encoding is determined by the start code. The default encoding method is B and it is used for upper and lower case alpha. A is used for upper case alpha and control characters, and C is used for digits, encoding 2 digits per barcode character. You can specify a different encoding method (either at the start and/or in the middle of the data) by using a special data character. eFORMz uses the exclamation mark to specify special data characters. The sequences for special data characters are:

"!A" - to specify or switch to CODE A
"!B" - to specify or switch to CODE B
"!C" - to specify or switch to CODE C

"!S" - To switch the next data character of CODE B if currently using CODE A, or to switch the next data character to CODE A if currently using CODE B.

There are also 4 different function codes that various organizations use to delimit fields within barcodes They are FNC 1, FNC 2, FNC 3, and FNC 4. The sequences for these are "!1", !2", "!3", and "4", respectively.

For example:

"[Start_C]FNC1961180417342237010195 1" should be "!C!1961180417342237010195 1"
"[Start_C]FNC142013326" should be "!C!142013326"

For a list of Code 128 characters, visit: http://www.adams1.com/128table.html

The final size of the barcode depends on the dimension of the smallest bar, the type of barcode, and the number of characters encoded. This website has a handy calculator to figure the total width: http://www.adams1.com/128code.html

POSTNET

The Postal Service developed the POSTNET (Postal Numeric Encoding Technique) barcode to encode zip code information on letter mail for rapid and reliable sorting by barcode sorters (BCSs). The POSTNET barcode can represent a five-digit ZIP Code (32 bars), a nine-digit ZIP+4 code (52 bars), or an eleven-digit delivery point code (62 bars).

For example:

USPS Intelligent Mail

The US Postal Service is promoting the use of this barcode because it expands the ability to track individual mail pieces and provides customers with greater visibility into the mail-stream. USPS will require the use of this barcode to qualify for automation printing beginning in May 2011. For further information, see:

https://ribbs.usps.gov/intelligentmail_mailpieces/documents/tech_guides/SPUSPSG.pdf

The information to be barcoded is a string of numbers 20 to 31 digits long. Its layout is described in section 3.1.3 of the above manual. Please note that the only validation that eFORMz performs on the data is to make sure there are at least 20 digits and that all the characters are digits.

The physical dimensions of the barcode are described in section 3.3. From this we determined that the "Width" should be set between 14.976 and 18 decipoints and the height should be set between 30 and 39.6 decipoints.

2D Barcodes

2D Barcodes can be created using a custom or system variable. eFORMz supports the following 2D Barcodes:

Aztec

Data Matrix

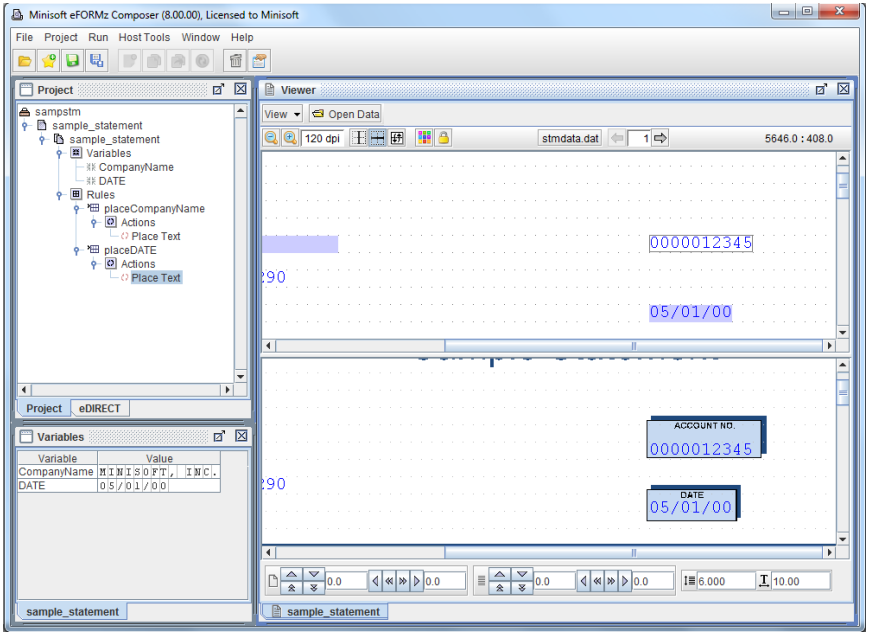
MaxiCode

PDF417

Quick Response (QR)

To create a 2D Barcode using data from your input file, use the following method:

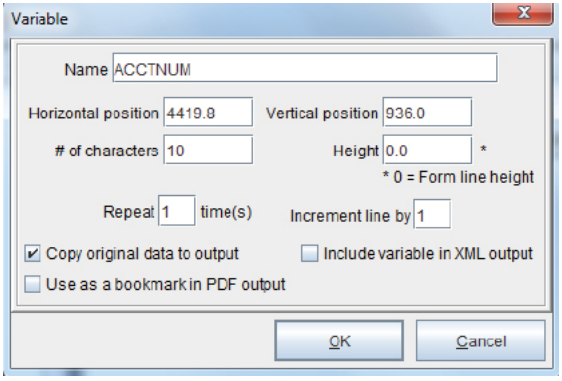
1. From the Data Viewer highlight the selected range of data you would like to barcode or create a custom variable.



For assistance in creating the correct specification for 2D Barcodes, feel free to contact your Minisoft support representative for further information.

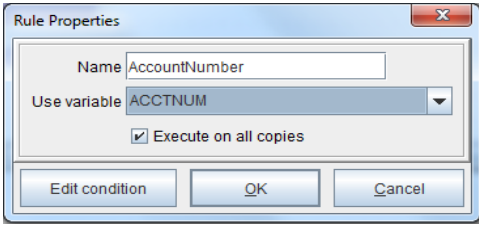
2. *Right click* and select *Add Rule* > *2D Barcode*.

3. From the *Variable* dialog box enter a new variable name and click *OK*:

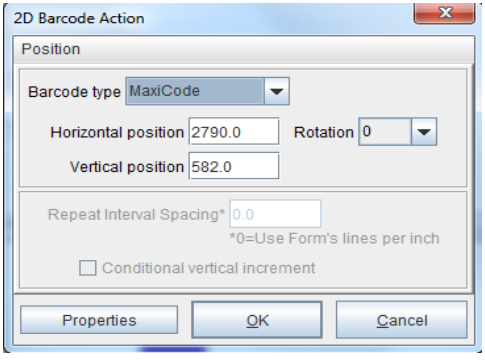


***TIP*:** If you would like the original data to appear in its original position select *Copy original data to output*.

4. The *Rules* dialog box displays. Enter a new rule name and click *OK*.



5. From the *2D Barcode Action* dialog box, select the barcode type:



Once your barcode specifications have been set click *OK*.

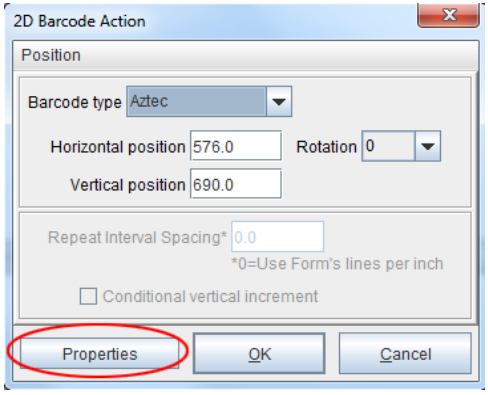
2D Barcode Types

Aztec

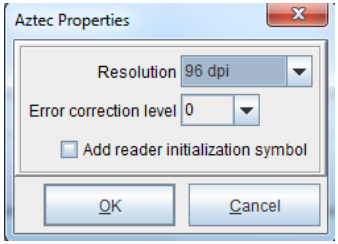
The Aztec barcode is a matrix barcode type that does not require quiet zones:

0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

From the *2D Barcode Action* dialog box, select *Properties:*



The *Aztec Properties* dialog box will display:



Options:

Resolution
The density of the barcode. 96 dpi (dots-per-inch) is low resolution, while 600 dpi is high resolution. The default is 96 dpi.

Error correction level
The Reed-Solomon error correction level placed in the symbol. More error correction creates a bigger symbol that is less likely to be damaged. Exceeding a level of 23 is not recommended, especially with larger amounts of data.

Add reader initialization symbol
Default unchecked. The reader intialization symbol is needed for older barcode scanners. If checked, the reader initilization symbol will be added to the Aztec barcode.

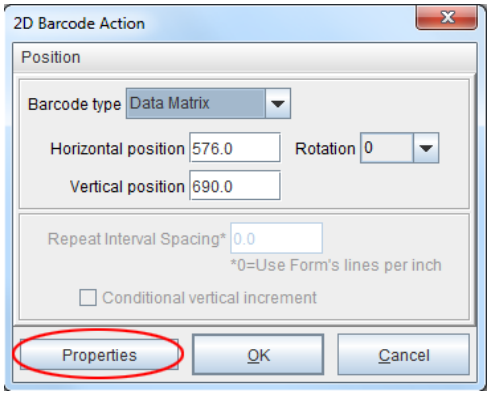
Characters, text, numeric values and bytes of data can be encoded in an Aztec barcode. A two-dimensional imaging device such as a CCD (charge-coupled device) camera is necessary to scan the symbology.

Data Matrix

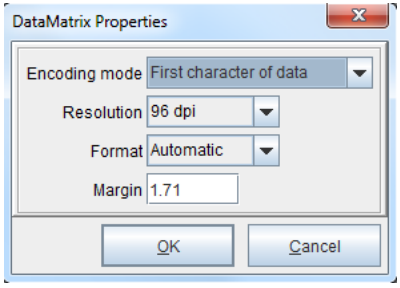
The Data Matrix barcode is a matrix symbol which allows efficient encoding of data into a square barcode. It includes data correction:

0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

From the *2D Barcode Action* dialog box, select *Properties:*



The *DataMatrix Properties* dialog box will display:



Options:

Encoding Mode

The data represented in the symbol may be encoded using one of the following modes:

The *ASCII* option encodes data that contains ASCII characters (0-127), such as text that includes uppercase and lowercase letters, with or without numbers and punctuation.

The *C40* option encodes data that holds only numeric values and uppercase characters.

The *Text* option encodes data that contains numeric values and lowercase characters.

The *BASE256* option can encode images, double-byte characters, binary data and 8-bit values.

The default mode is the *First character of data* option, which compresses (encodes) the data based upon the the first character of the selected string being a single digit. This first character will not be a part of the barcode.

Resolution

The density of the barcode. 96 dpi (dots-per-inch) is low resolution, while 600 dpi is high resolution. The default is 96 dpi.

Format

There are 31 formats, which refer to the sizing of the DataMatrix barcode in relation to its data capacity. The default format is *Automatic*, which adopts the barcode format based upon the numeric, alphanumeric and binary capacity of the amount of data encoded. The other 30 format sizes have various capacity requirements. An internet search for the maximum data capacity for the different symbol sizes will yield multiple results. A helpful table can be found at the following URL:
http://www.idautomation.com/barcode-faq/2d/data-matrix/#DataMatrix_Formats

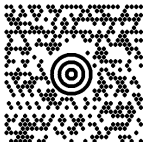
Margin

The quiet zone border. The quiet zone border is the blank border of a barcode that indicates the barcode boundaries. The default is 1.71 decipoints.
1 pixel = 7.5 decipoints.

Characters, text, numeric values and bytes of data can be encoded in a Data Matrix barcode. A two-dimensional imaging device such as a CCD camera is necessary to scan the symbology.

MaxiCode

The MaxiCode is used primarily by UPS to route and track packages:



[)>~03001~02996890520000~029840~029003~0291Z12898809~029UPSN~029868124~029246~029~0291/1~029000~029N~029~029HENDERSON~029NV~030~004

MaxiCode barcodes are fixed-size codes which hold up to 93 data characters. MaxiCodes encode two messages. The main message typically encodes the postal code, country code and the service code. The secondary message typically encodes a shipping address, though it can also encode other information. The symbology may be used in different modes:

MaxiCode Encoding Modes	
Mode	***Use***
0	Obsolete.
1	Obsolete.
2	Primary message encodes the numeric postal code (US Carrier) up to nine digits in length, country code and service code while the secondary message encodes additional data. Up to 93 characters may be encoded.
3	Primary message encodes the alphanumeric postal code (International Carrier) up to six digits in length, country code and service code while the secondary message encodes additional data. Up to 93 characters may be encoded.
4	Standard Symbol. General information is encoded. Any data up to 90 data characters is automatically split between primary and secondary messages.
5	Secure Symbol. General information is encoded. Any data up to 74 data characters is automatically split between primary and secondary messages. Enhanced error correction is employed.

6	Reader Program. Used for programming hardware devices, such as barcode readers.

The following is an example of encoding data in MaxiCode barcodes in eFORMz, using Mode 2. The data encoded begins with [)>RS01GS as required by UPS. Next, the 2-digit format of the year (YY) is added. This is followed by the zip code, which is a numeric-only 5-digit zip code with a 4-digit zip code extension. If no extension exists, four zeros (0000) must be specified. Next, the 3-digit country code is added. For mode 2, which is used for US carriers, the country code is 840. For other country codes, mode 3 should be used instead. After this, the 3-digit class of service code is added. The secondary message follows, and it has more flexibility.

The following basic format should look as follows:

[)>RS01GSYearPostalCodeGSCountryGSServiceGSmessage

Our detailed example, with a sample secondary message, will look as follows:

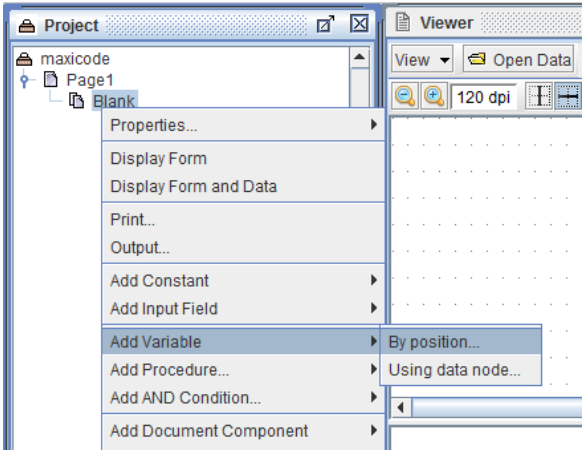
"[)>"+RS+ "01"+GS+ "96890520000"+GS+ "840"+GS+ "003"+GS+ "1Z128
98809"+GS+"UPSN"+GS+"868124"+GS+"246"+GS+GS+"1/1"+GS+GS+"
N"+GS+GS+"HENDERSON"+GS+"NV"+RS+EOT

There are three character delimiters used, each with an American Standard Code for Information Interchange (ASCII) value. The RS character delimiter has a value of ~030, the GS character delimiter has a value of ~029 and the EOT character delimeter has a value of ~004. The data is encoded with this string:

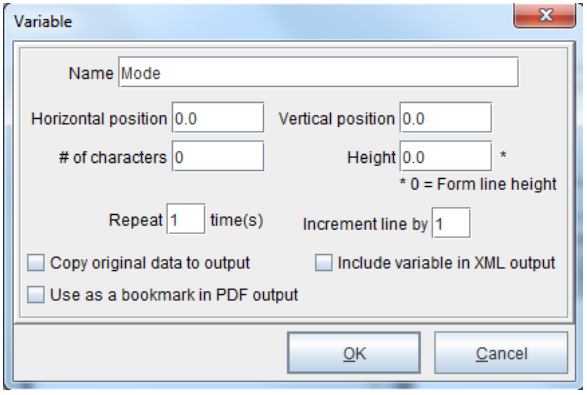
[)>~03001~02996890520000~029840~029003~0291Z12898809~029UPS
N~029868124~029246~029~0291/1~029~029N~029~029HENDERSON~
029NV~030~004

The following is the process of encoding data in MaxiCode barcodes in eFORMz, using Mode 2.

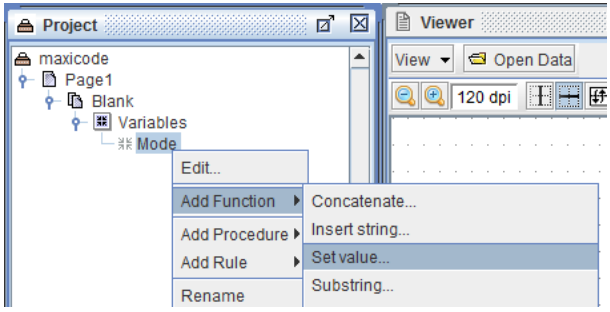
1. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.*



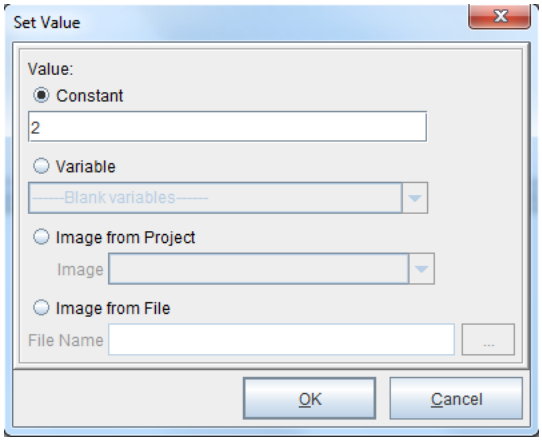
2. The *Variable* dialog box will display. Enter 'Mode' in the *Name* field.



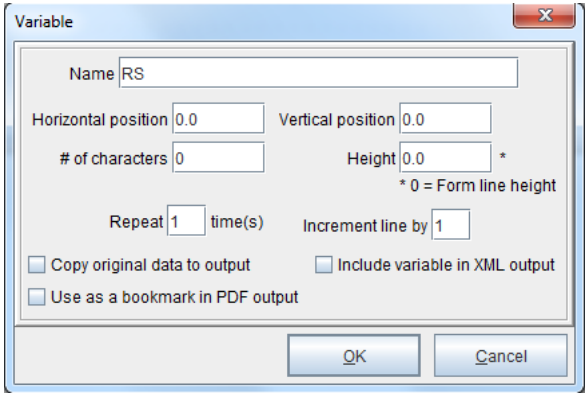
3. *Right click* the variable and select *Add Function* > *Set Value*.



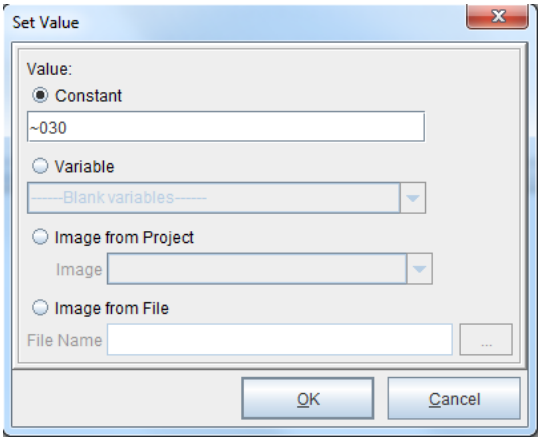
4. The *Set Value* dialog box will display. Enter a value of 2 in the *Constant* field.



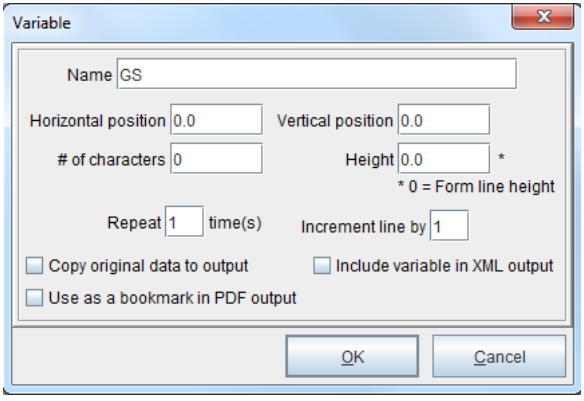
5. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.* The *Variable* dialog box will display. Enter 'RS' in the *Name* field.



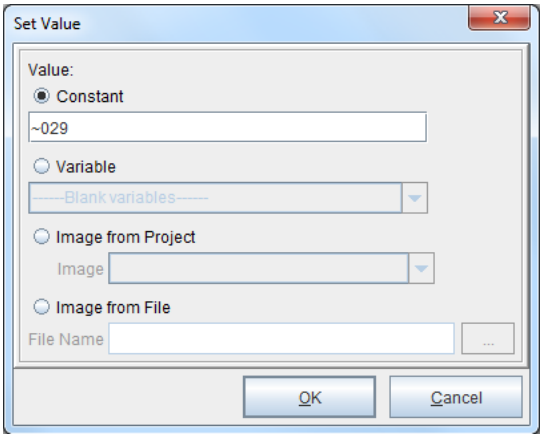
6. *Right click* the variable and select *Add Function* > *Set Value*. The *Set Value* dialog box will display. Enter a value of ~030 in the *Constant* field.



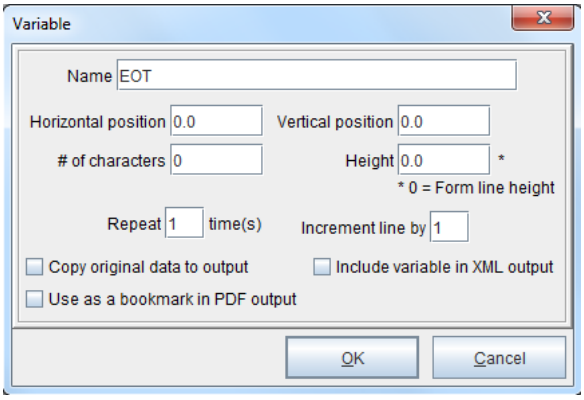
7. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.* The *Variable* dialog box will display. Enter 'GS' in the *Name* field.



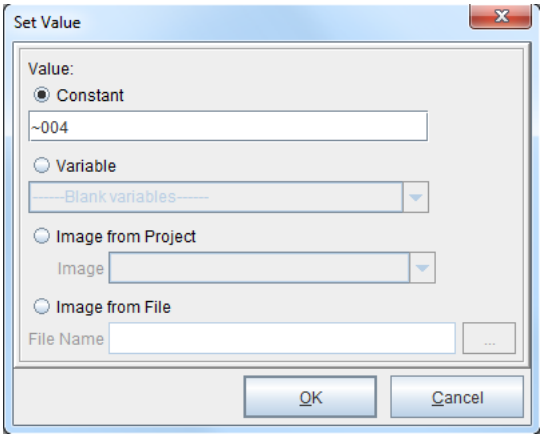
8. *Right click* the variable and select *Add Function* > *Set Value*. The *Set Value* dialog box will display. Enter a value of ~029 in the *Constant* field.



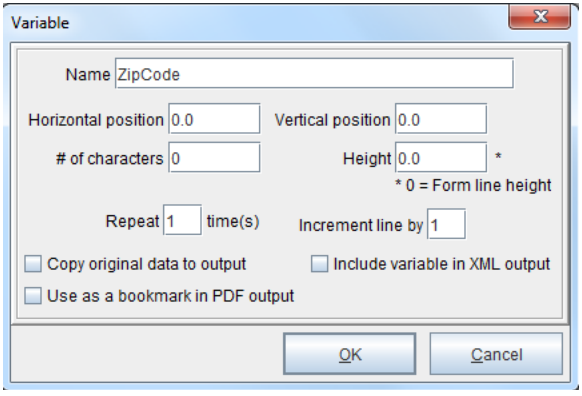
9. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.* The *Variable* dialog box will display. Enter 'EOT' in the *Name* field.



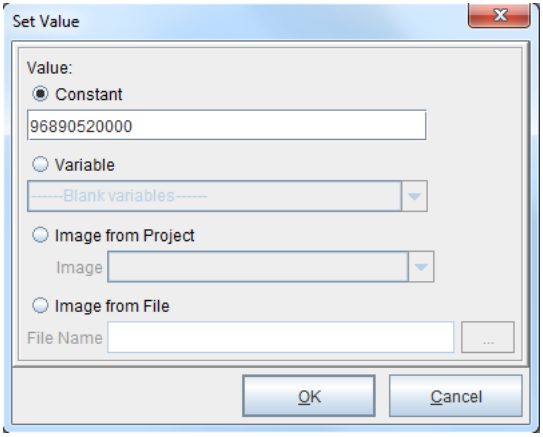
10. *Right click* the variable and select *Add Function* > *Set Value*. The *Set Value* dialog box will display. Enter a value of ~004 in the *Constant* field.



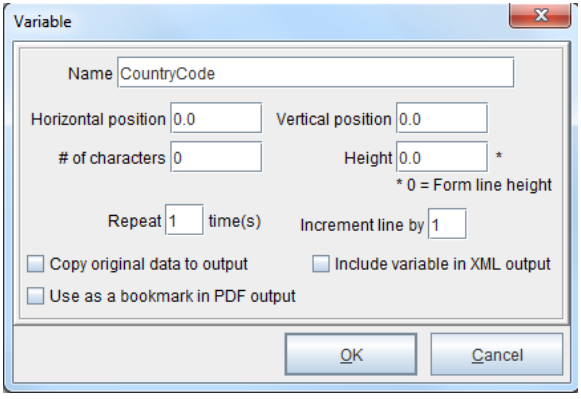
11. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.* The *Variable* dialog box will display. Enter 'ZipCode' in the *Name* field.



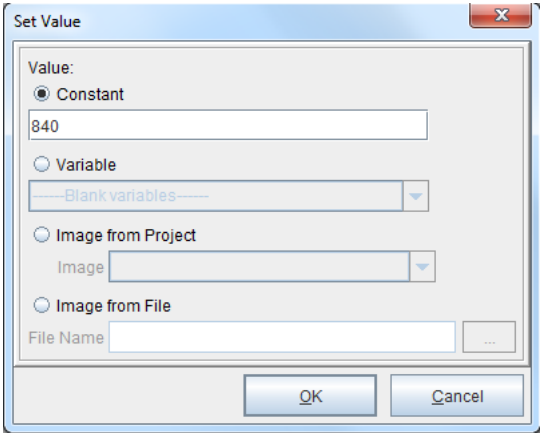
12. *Right click* the variable and select *Add Function* > *Set Value*. The *Set Value* dialog box will display. Enter the value for the zip code. The first two digits should be the year, followed by the nine digit zip code. For this example, a value of 96890520000 is entered in the *Constant* field. 96 represents the year, 89052-0000 is the zip code.



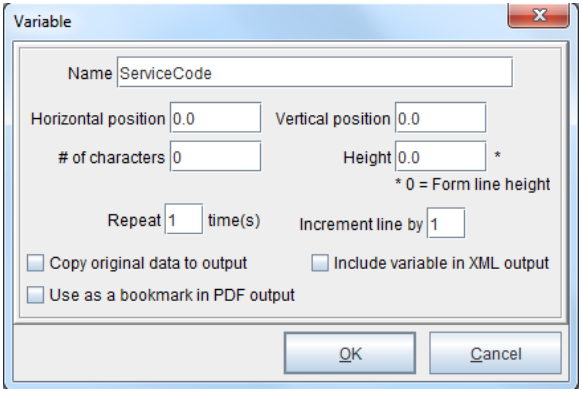
13. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.* The *Variable* dialog box will display. Enter 'CountryCode' in the *Name* field.



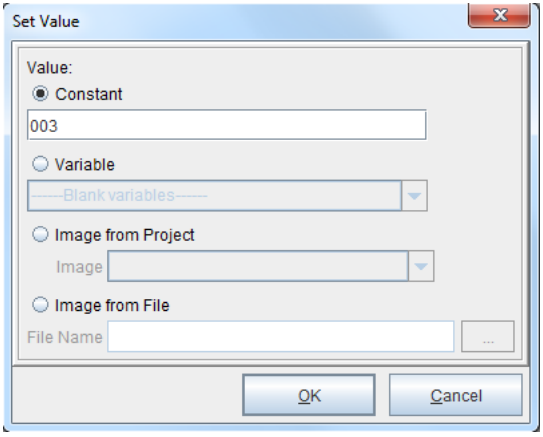
14. *Right click* the variable and select *Add Function* > *Set Value*. The *Set Value* dialog box will display. Enter the value of the country code. For MaxiCode mode 2, this is typically the United States country code of 840. So, a value of 840 is entered in the *Constant* field.



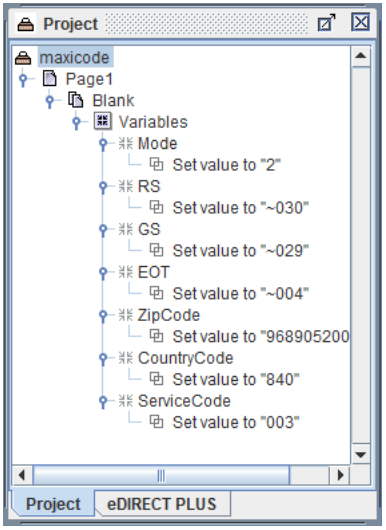
15. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.* The *Variable* dialog box will display. Enter 'ServiceCode' in the *Name* field.



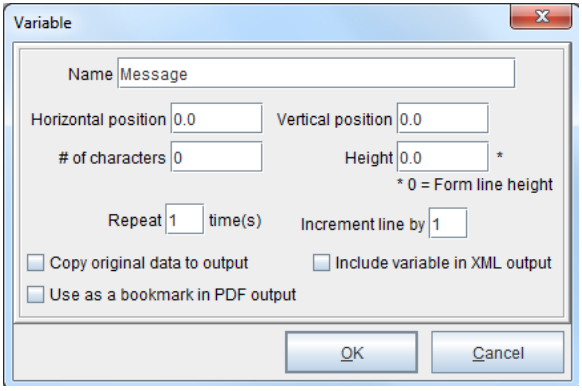
16. *Right click* the variable and select *Add Function* > *Set Value*. The *Set Value* dialog box will display. Enter the value of the service code. For this example, a value of 003 is entered in the *Constant* field.



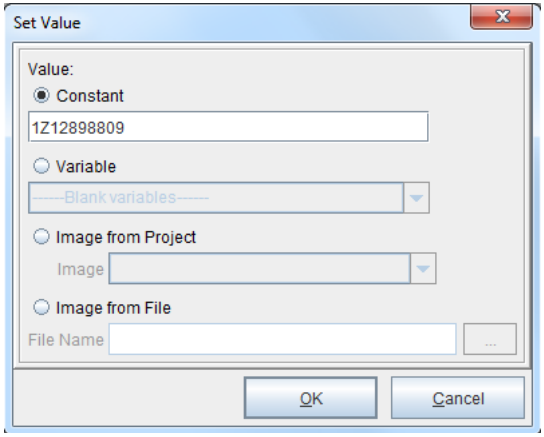
Once complete, the Project Window should look as follows:



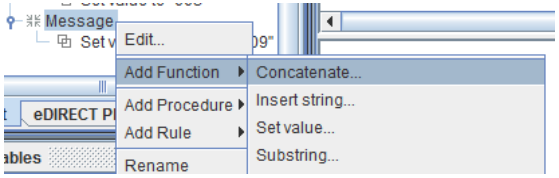
17. After defining the delimiter characters and primary codes, the secondary message that will be encoded can be defined. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.* The *Variable* dialog box will display. Enter 'Message' in the *Name* field.



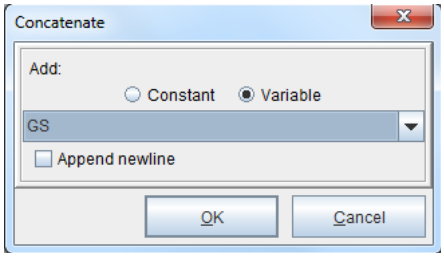
18. *Right click* the variable and select *Add Function* > *Set Value*. The *Set Value* dialog box will display. Enter the UPS tracking number. For this example, a value of 1Z12898809 is entered in the *Constant* field.



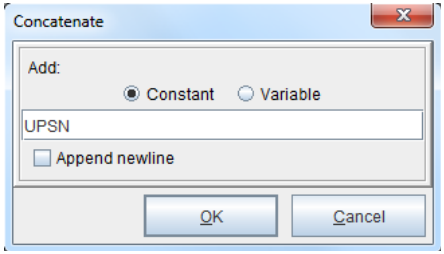
19. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.*



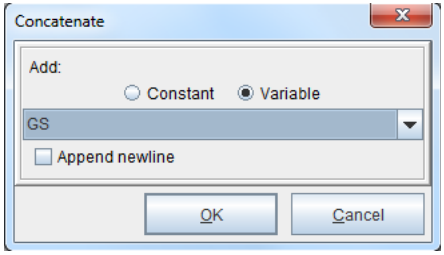
20. The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



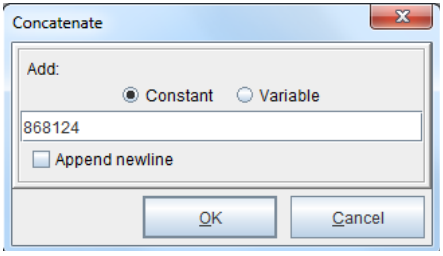
21. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter a value of 'UPSN'. This is the Standard Carrier Alpha Code for UPS.



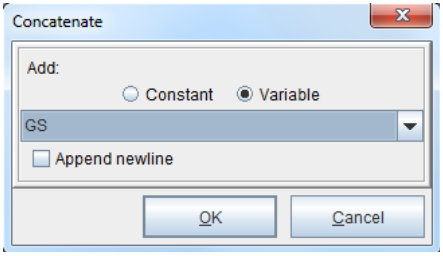
22. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



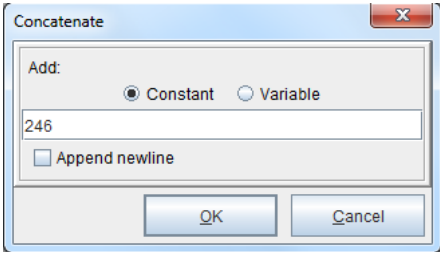
23. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter the UPS shipper number. A value of '868124' was entered for this example.



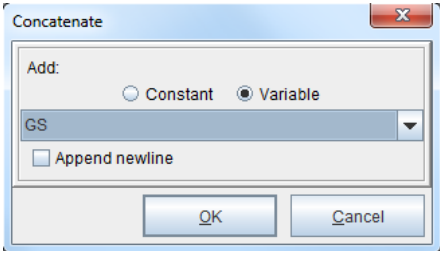
24. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



25. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter the Julian day of pickup. In this example, a value of '246' was entered.

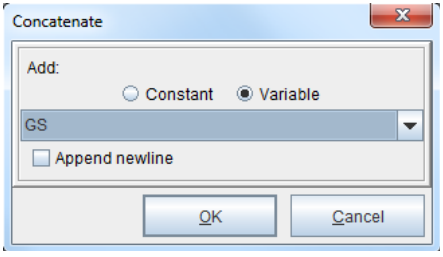


26. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.

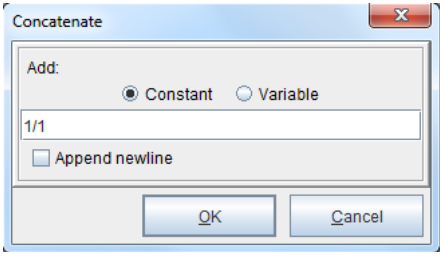


27. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter the 7-digit shipment ID number. In this example, a shipment ID number is not used.

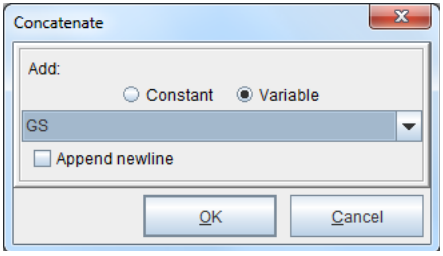
28. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



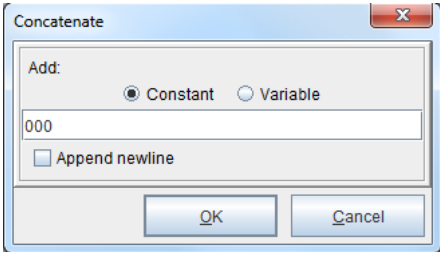
29. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Specify the number of packages (package x of y format). A value of '1/1' is used in this example.



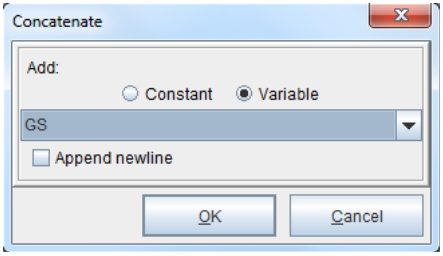
30. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



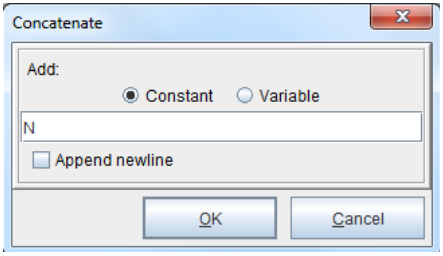
31. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter the package weight. A value of 'ooo' is used in this example.



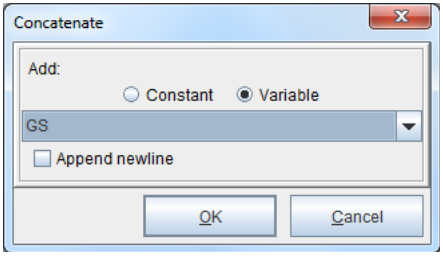
32. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



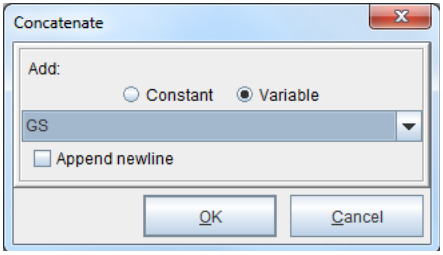
33. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter a 'Y' or 'N' value for address validation. For our example, our address doesn't need to be validated, so a value of 'N' is entered.



34. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.

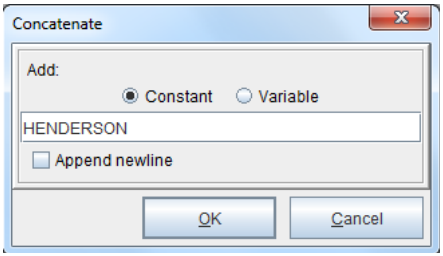


35. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.

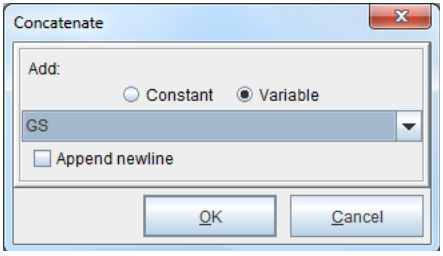


36. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter the ship-to street address. In this example, a street address is not used. After using a street address, *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.

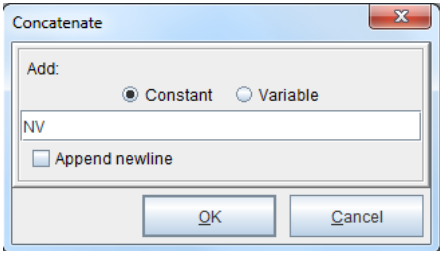
37. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter the ship-to city. In this example, a value of 'HENDERSON' is used.



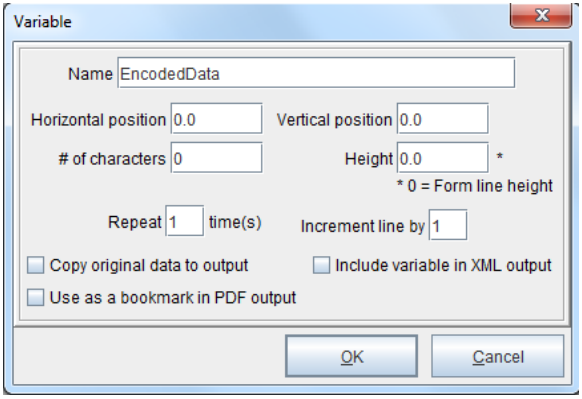
38. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



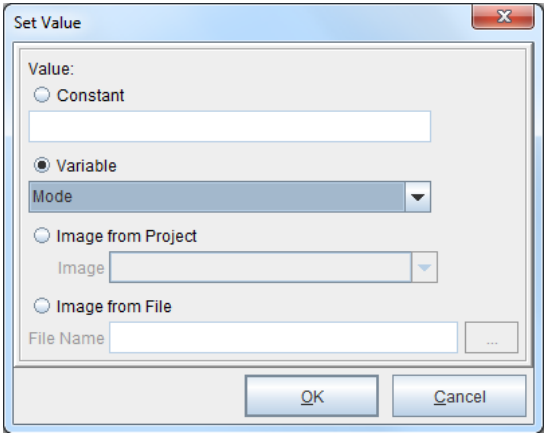
39. *Right click* the 'Message' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter the ship-to city value. In this example, a value of 'NV' is used.



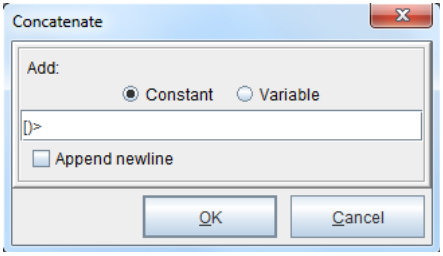
40. With the secondary message complete, the primary carrier message and the secondary message can be encoded. From the eFORMz Project Window, *right click* the form and select *Add Variable* > *By position.* The *Variable* dialog box will display. Enter 'EncodedData' in the *Name* field.



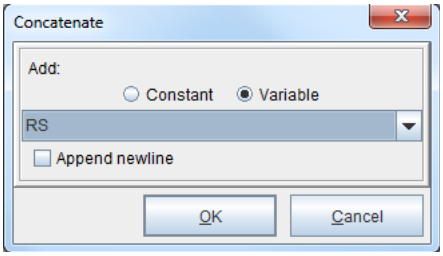
41. *Right click* the variable and select *Add Function* > *Set Value*. The *Set Value* dialog box will display. Select the 'Mode' variable created earlier from the drop-down menu.



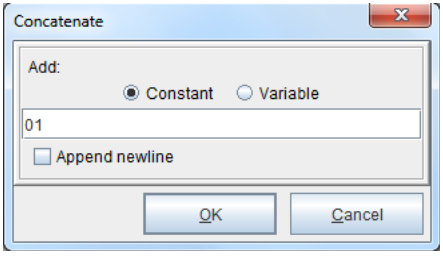
42. The required opening data string of encoded data for a mode 2 message is '[)>RS01GS'. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter a value of '[)>'. This value is required by UPS and represents the beginning of the message header.



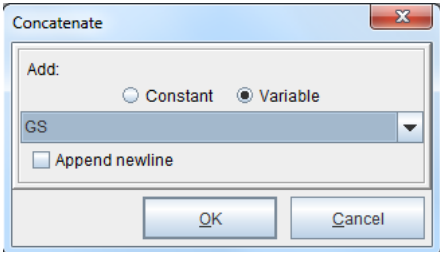
43. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'RS' variable created earlier from the drop-down menu. The RS character delimiter is required by UPS and completes the message header portion of the required data string.



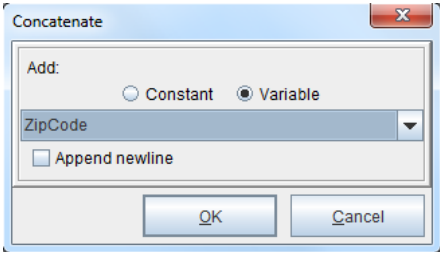
44. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Enter a value of '01'. This value is required by UPS and represents the beginning of the format header of the required data string.



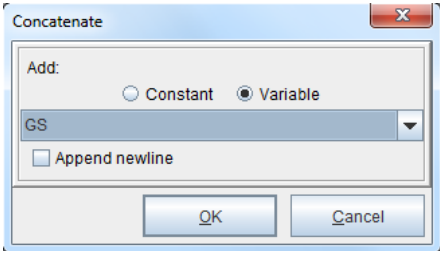
45. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu. The GS character delimiter is required by UPS and completes the format header of the opening data string of the encoded data.



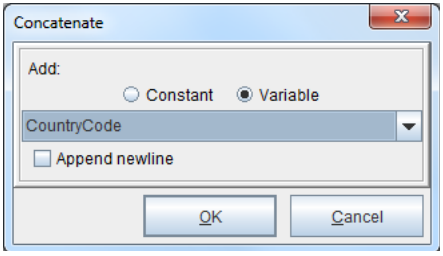
46. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'ZipCode' variable created earlier from the drop-down menu.



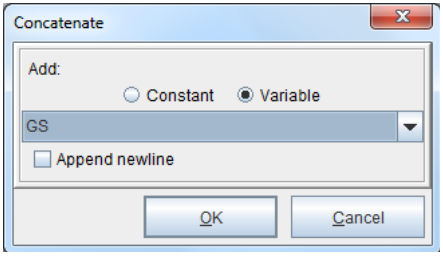
47. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



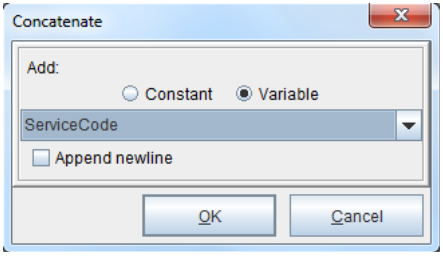
48. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'CountryCode' variable created earlier from the drop-down menu.



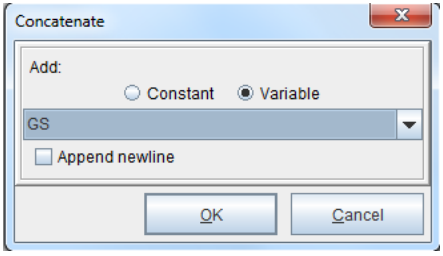
49. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



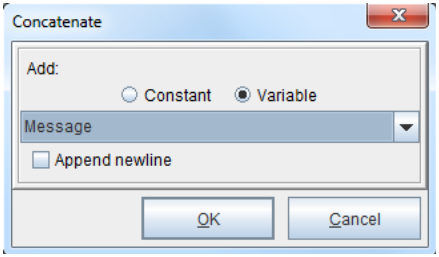
50. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'ServiceCode' variable created earlier from the drop-down menu.



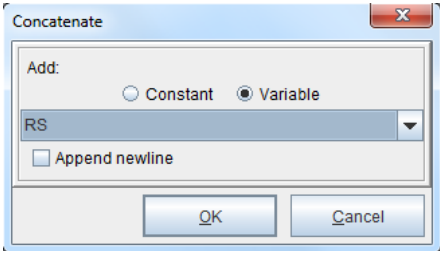
51. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'GS' variable created earlier from the drop-down menu.



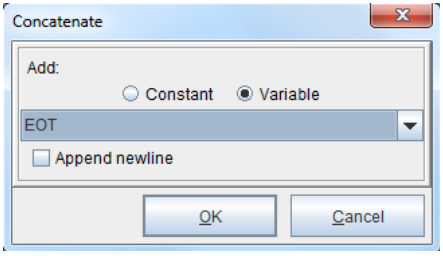
52. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'Message' variable created earlier from the drop-down menu.



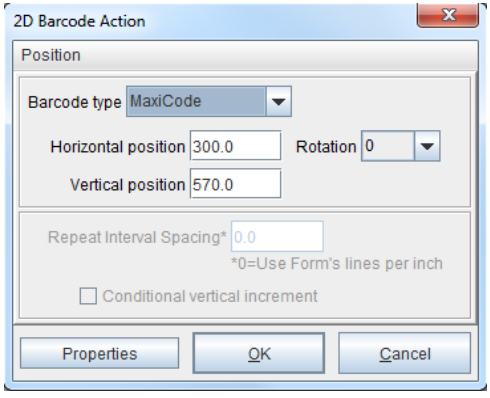
53. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'RS' variable created earlier from the drop-down menu.



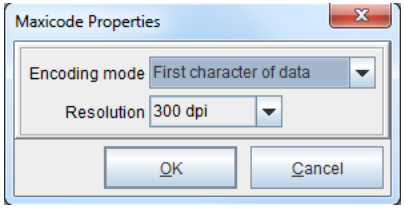
54. *Right click* the 'EncodedData' variable and select *Add Function* > *Concatenate.* The *Concatenate* dialog box will display. Select the 'EOT' variable created earlier from the drop-down menu. This character concludes the encoded data message.



From the *2D Barcode Action* dialog box, select *Properties:*



The *Maxicode Properties* dialog box will display:



Options:

Encoding Mode

The encoding mode options are noted in the MaxiCode Encoding Modes table on page 24. The default mode is the *First character of data* option, which compresses (encodes) the data based upon the the first character of the selected string being a single digit. This first character will not be a part of the barcode.

Resolution

The density of the barcode. 96 dpi (dots-per-inch) is low resolution, while 600 dpi is high resolution. The default is 300 dpi.

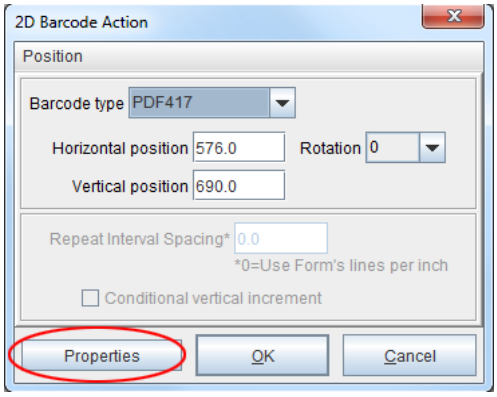
A two-dimensional imaging device such as a CCD camera is necessary to scan the symbology.

PDF417

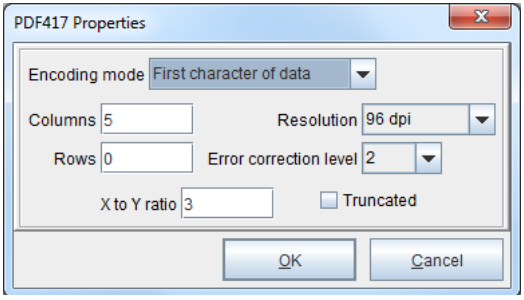
The PDF417 barcode is a unique 2D barcode type is commonly used on FedEx shipping labels:

0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

From the *2D Barcode Action* dialog box, select *Properties:*



The *PDF417 Properties* dialog box will display:



Options:

Encoding Mode
There are three encoding modes. The *Text* option encodes the majority of text characters, while the *Binary* option encodes data bytes. The *Binary* option is used for international and extended characters. The default mode is the *First character of data* option, which compresses (encodes) the data based upon the the first character of the selected string being a single digit. This first character will not be a part of the barcode.

Columns
The number of data columns.

Rows
The number of rows of codewords.

X to Y Ratio
The X to Y ratio is the ration of the width of the narrowest barto the height of each row within the PDF417 symbol. The default value is 3, or a ratio of 1:3.

Resolution
The density of the barcode. 96 dpi (dots-per-inch) is low resolution, while 600 dpi is high resolution. The default is 96 dpi.

Error correction level
The Reed-Solomon error correction level placed in the symbol. The error correction level should be increased with the amount of data encoded. There are 7 levels.

Truncated
The *Truncated* option removes, or truncates, the right side of the PDF417 barcode.

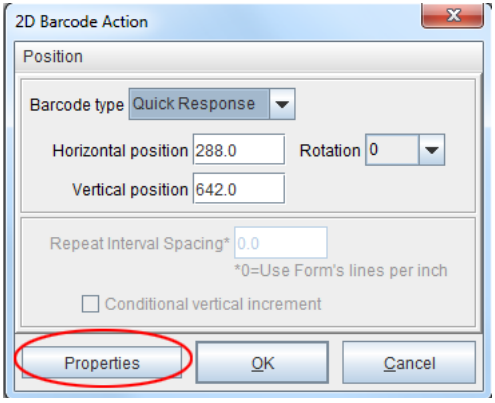
Characters, text, numeric values and bytes of data can be encoded in a PDF417 barcode. A two-dimensional imaging device such as a CCD camera is necessary to scan the symbology.

QR (Quick Response) Barcode

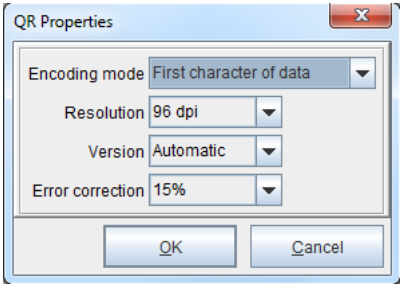
The Quick Response barcode is commonly used with smart-phone devices to direct users to additional information about a particular product:

http://www.minisoft.com/

From the *2D Barcode Action* dialog box, select *Properties:*



The *QR Properties* dialog box will display:



Options:

Encoding Mode

There are four encoding mode options. The *Byte* option can encode text, images, double-byte characters and 8-bit values. The *AlphaNumeric* option encodes only numbers and uppecase letters. Lowercase letters are converted to uppercase. The *Numeric* option encodes numeric values only. The default mode is the *First character of data* option, which compresses (encodes) the data based upon the the first character of the selected string being A, B, or N. These represent AlphaNumeric, Byte, and Numeric respectively. The Byte option is used if a different character is found. The character is not part of the bar code.

Resolution

The density of the barcode. 96 dpi (dots-per-inch) is low resolution, while 600 dpi is high resolution. The default is 96 dpi.

Version

There are 41 versions, which refer to the sizing of the QR barcode in relation to its data capacity. The default format is *Automatic*, which adopts the barcode size based upon the amount of data encoded. The other 40 format sizes have various capacity requirements.

Error correction

There are four options: 7%, 15%, 25% and 30%. The greater the error correction level, the larger the barcode size and the less data it can contain.

Characters, text, numeric values and bytes of data, including URL's, can be encoded in a QR barcode. A two-dimensional imaging device such as a CCD camera is necessary to scan the symbology.

Special Fonts

OCRA

OCRA is a special font that is used for Optical Character Recognition Systems. It is also used for server purposes when an automated systems need a standard character shape defined to properly scan numbers and text without the use of barcodes.

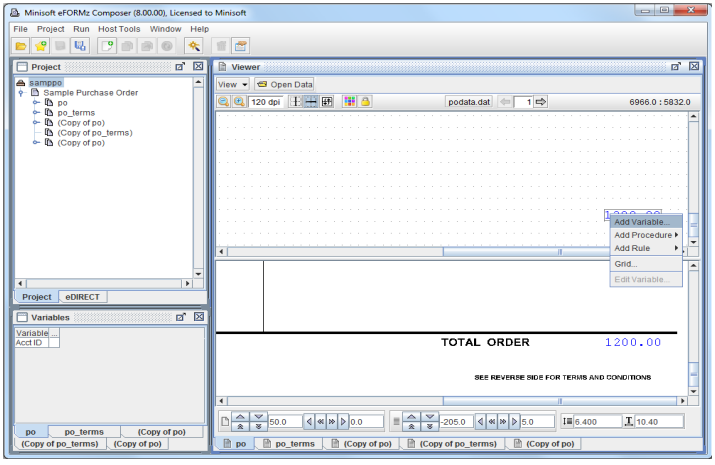
1234567890ABCDEFG

Secure Numeric Font

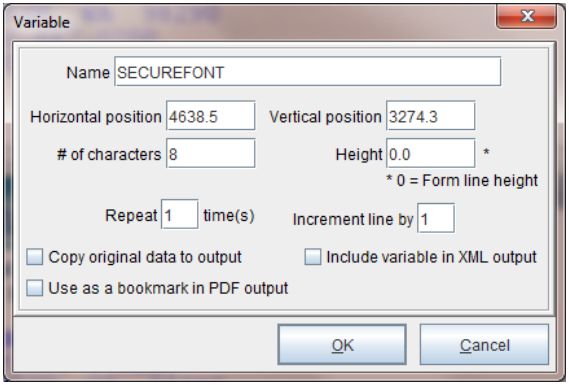
The secure numeric font permits an extra layer of security by imposing a unique font image representing the dollar value of the check, for example:

To create a secure numeric font:

1. From the eFORMz Viewer, *Input Data Viewer*, select the data you would like to apply the secure font to.
2. Right mouse click and select *Add Variable*.

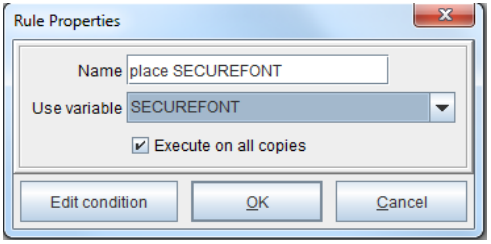


3. From the *Variable* dialog box, enter a new variable name and click *OK*.

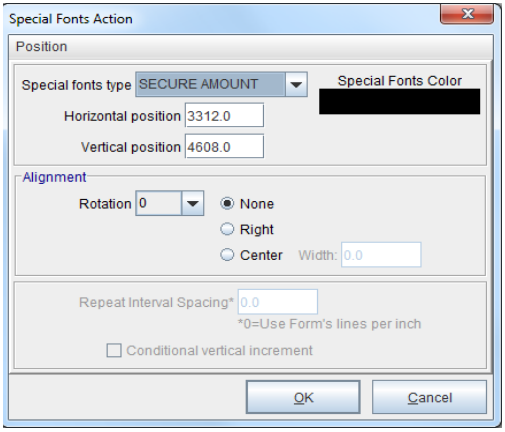


4. Your new variable will appear in the *Current Project* window.

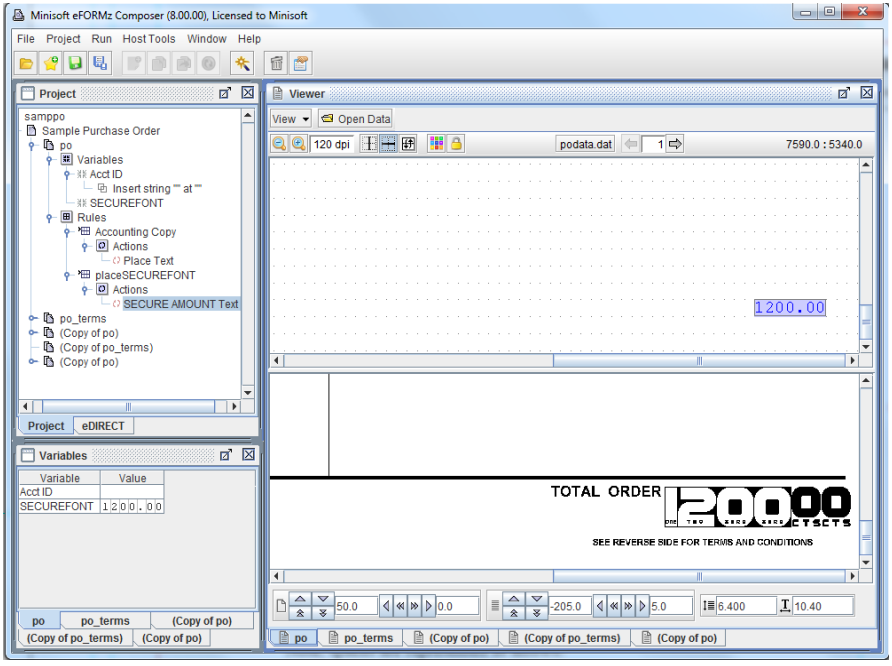
5. Next, create a new *Special Fonts* rule specifying the new variable.



6. The *Special Fonts Action* dialog box will display. Select Position and Paste if you previously selected a location for the secure font to appear, otherwise, select *Secure Amount* from the drop down selection of Special font:



7. The secure font will then appear in the Form and Data Viewer:

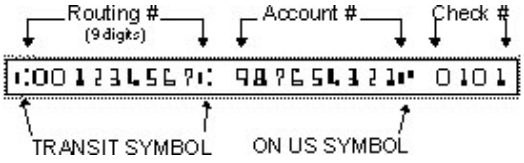


8. To implement the phrase "pay only" to the secure font, a dollar sign ($) can either be inserted at the beginning of the variable using an add Function option:

Note, spaces are represented as arrows:

MICR 13B and CMC-7 Font

The approved MICR 13B and CMC-7 (ISO 1004) font that prints check numbers compatible for magnetic ink reader systems. Below is an example routing number defining each section:



MICR 13B and CMC-7 Symbol Sets

MICR Fonts	
Character	***MICR 13B and CMC-7 Symbols***
1	⑆
2	⑇
3	⑈
4	⑉
5	⑊
6	⑋
7	⑌
8	⑍
9	⑎
0	⑀
$	⑁
-	⑂
/	⑃
&	⑄

Example routing string:

/123456/ &123456789& 9876-532/

Routing string converted into MICR code using eFORMz:

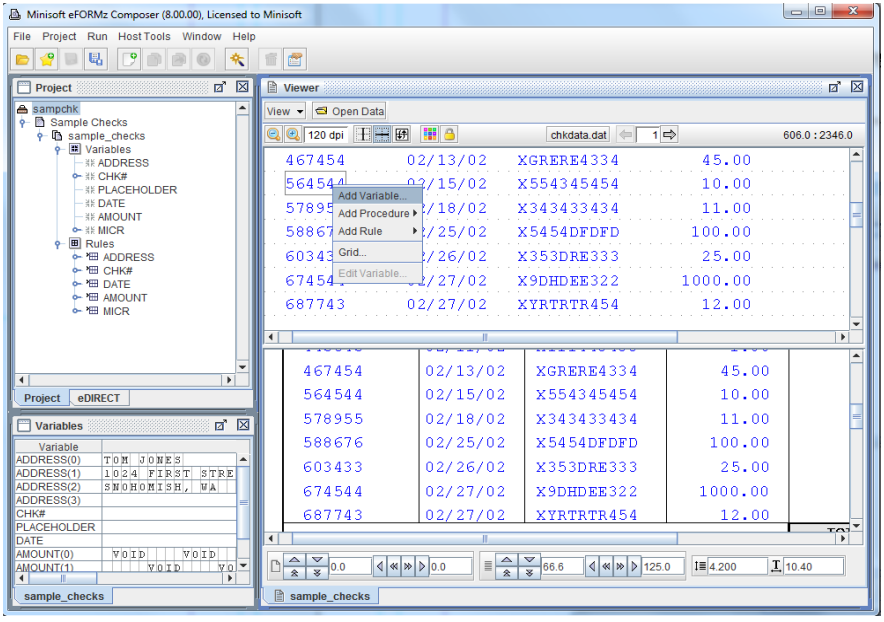
⑈123455⑈ ⑆123456789⑆ 9876⑉5432⑈

NOTE: Routing number combinations may vary.

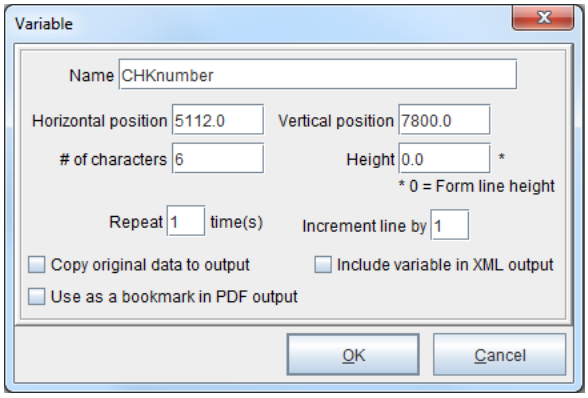
Creating a MICR 13B Routing String

To create a MICR font string:

1. From the eFORMz Viewer, *Input Data Viewer*, select the check number you would like to include in the MICR line.
2. Right mouse click and select *Add Variable*.

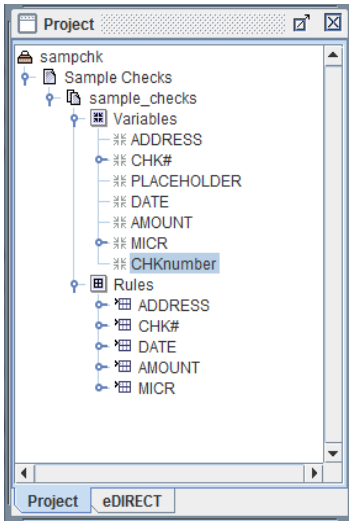


3. From the *Variable* dialog box, enter a new variable name and click *OK*.



TIP: If you do not wish the check number to appear in its original location, confirm that the option *Copy original data to output* is unchecked.

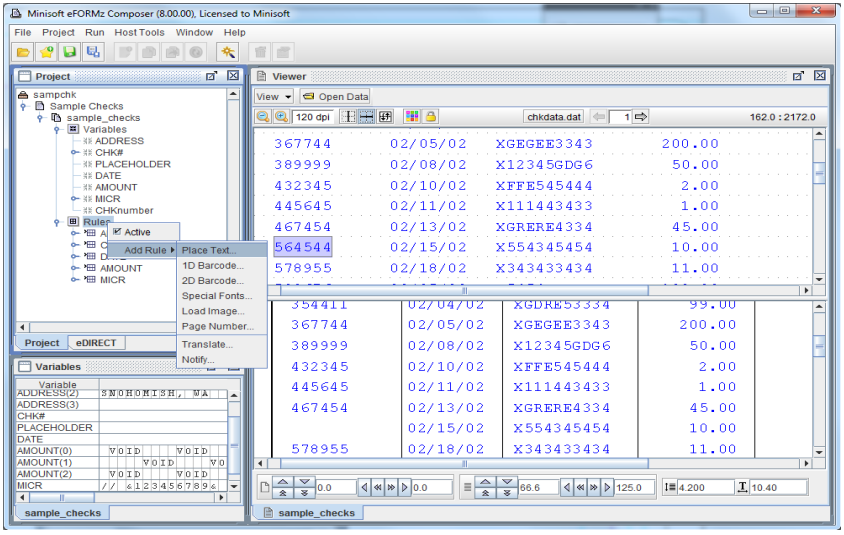
4. Your new variable will appear in the *Current Project* window:



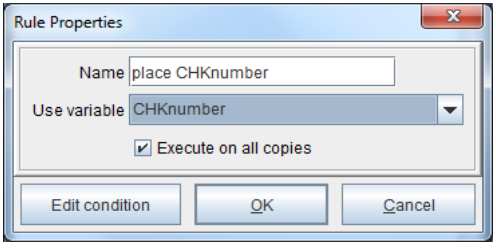
If the check number needs to be placed in a second position, for example, in the check number placeholder do the following, otherwise, see instruction number 5.

From the eFORMz Viewer, Form and Data Viewer, right mouse click in the area you would like the check number to appear and select *Copy Position*.

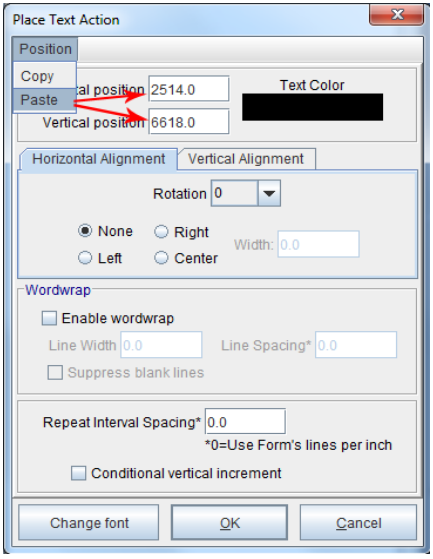
From the *Current Project* window select *Rules* > *Add Rule* > *Place Text*.



From the *Rule Properties* dialog box enter a new rule name. Select *CHKnumber* as the variable type and click *OK*.

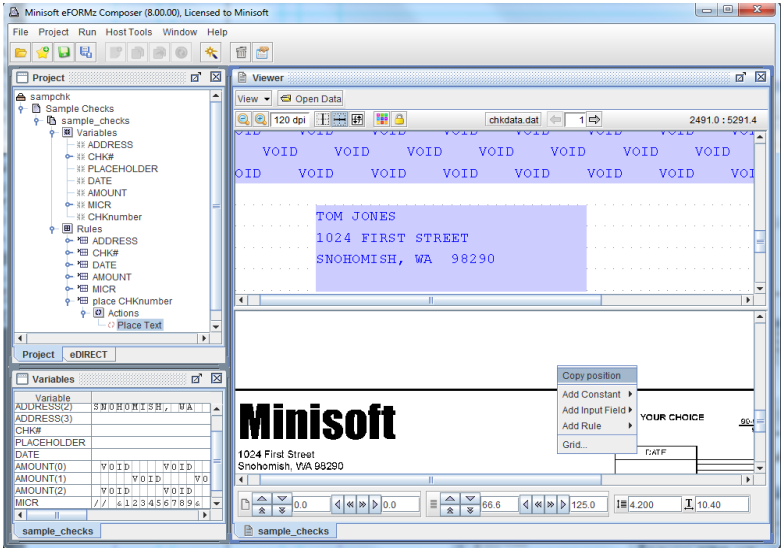


The *Place Text* dialog box will display, select *Position* > *Paste*. The coordinates copied earlier will display in the horizontal and vertical position fields.

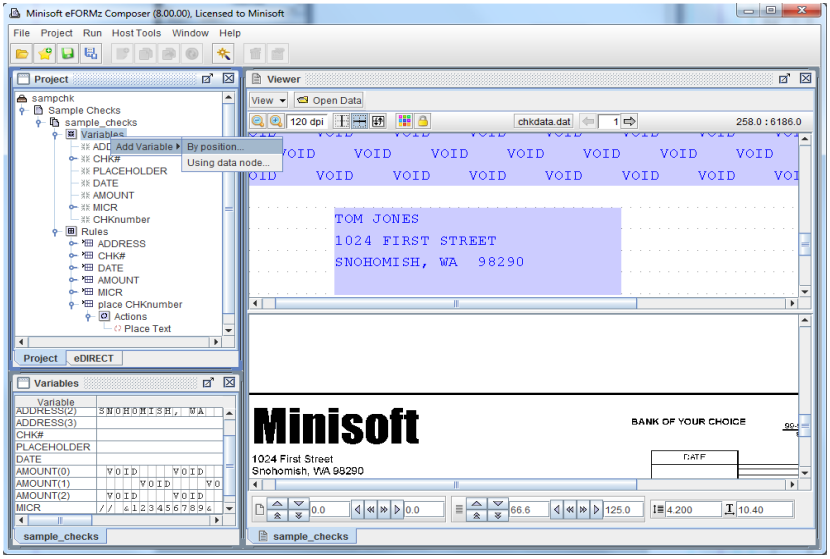


Click *OK* from the Move Action dialog box and the check number will appear in the Form and Data Viewer. To slightly adjust the position, take your mouse and click-and-drag the check number into position.

5. From the eFORMz Viewer, Form and Data Viewer, right mouse click in the area you would like the MICR sting to appear and select *Copy Position*.

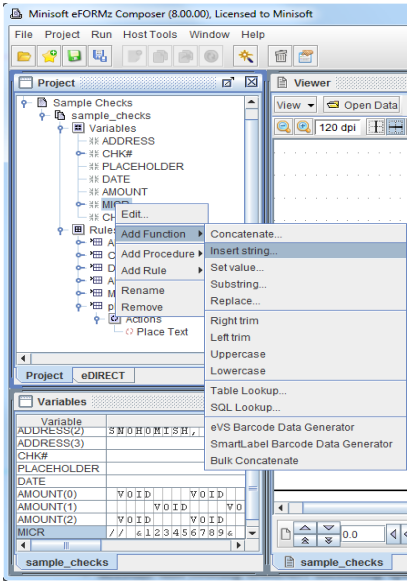


6. From the Current Project window create a new variable by selecting *Variable* > *Add Variable* > *By Position*.



7. The *Variable* dialog box will display, enter a new variable name and click *OK*.

8. Select the new variable from the Current Project window, *right click*, and select *Add Function* > *Insert String*.



9. The Insert Text dialog box will display. For this example we are going to split the MICR line into three sections:

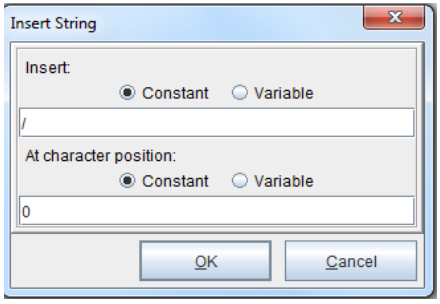
   /567888/ &123456789& 9876-5432/

   - first character string / (ON US)
   - check number (6 digit number)
   - account and routing numbers including special characters (/ &12345678 9& 9876-5432/)

   Note: Routing number combinations may vary.

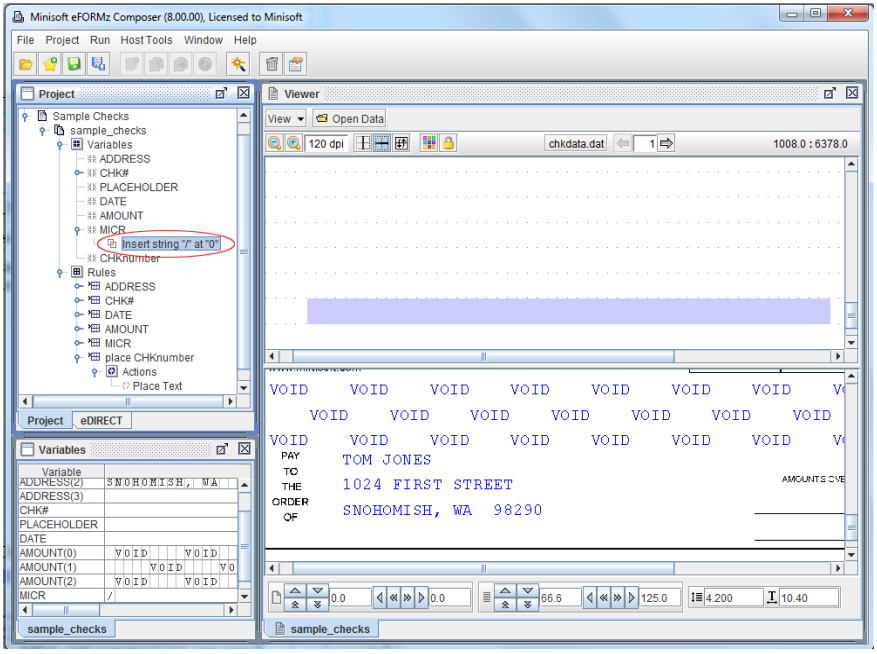
MICR Font		
Character	***Symbol***	***Meaning***
$		Amount
-		Dash
/		ON US
&		Transit

10. From the *Insert* > *Constant* field enter the starting character of your MICR line. In the *At character position Constant* enter character position *0*.



   Click *OK*.

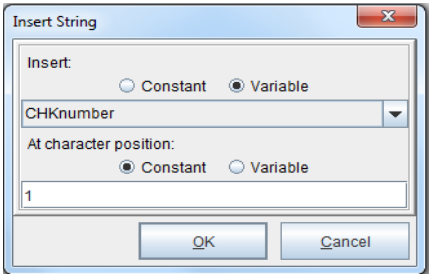
11. Your new variable string will appear in the Current Project window.



12. From the *Current Project* window highlight the same variable as before (MICR), *right click* and select *Insert String*.

13. The Insert String dialog box will display. Since a check number variable was created earlier (CHKnumber), select *Variable* for the Insert field. From the list of options select the variable name, CHK*number,* which was created earlier.

    Enter the number one (1) in the *Constant* field for the *At Character Position*.

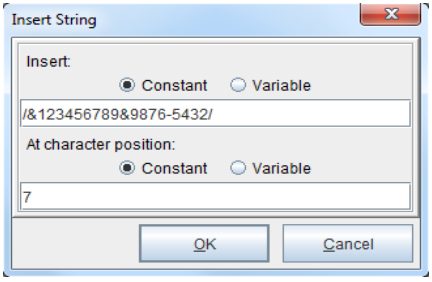


    Click *OK*.

14. Create a third string for the variable *MICR. Right click MICR* and select *Add Function > Insert string*.

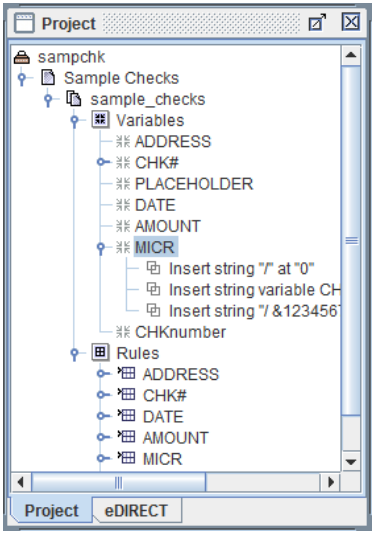
15. The Insert String dialog box will display.

    Insert the remaining characters, account and routing numbers into the *Insert > Constant* field. In the *At Character Position* field enter the starting position of the remaining character, in this case, character position 7.



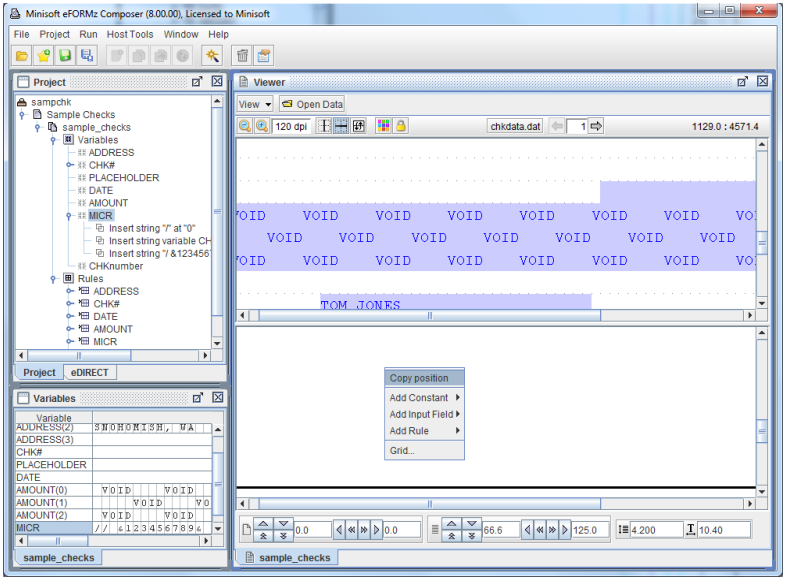
    Once complete, click *OK*.

16. The Current Project window will display all three *Insert String* functions.

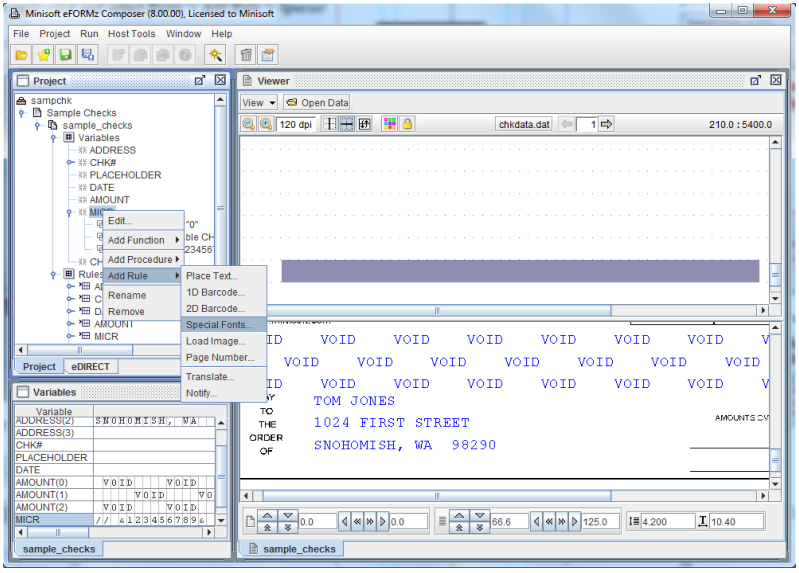


To place the MICR line:

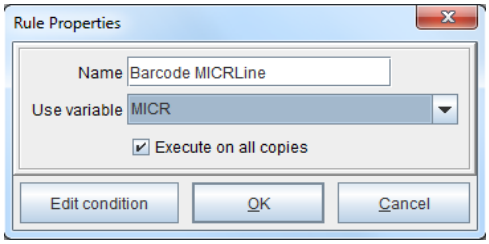
1. From the eFORMz Viewer, Form Viewer, *right click* in the area you would like the MICR line to appear and select *Copy Position*.



2. From the Current Project window *right click* and select *Rules* > *Add Rule* > *Special Fonts*.

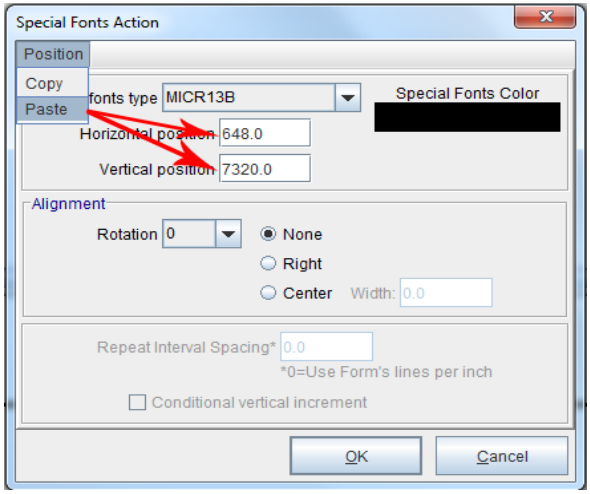


3. The *Rules* dialog box will display. Enter a new rule name and select *MICRstring* as the variable selection.



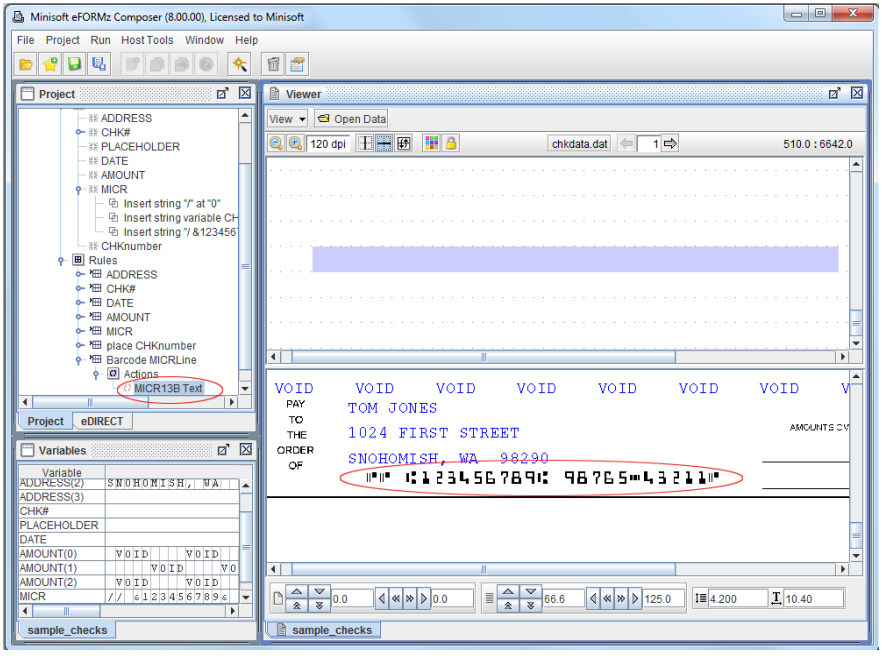
Click *OK*.

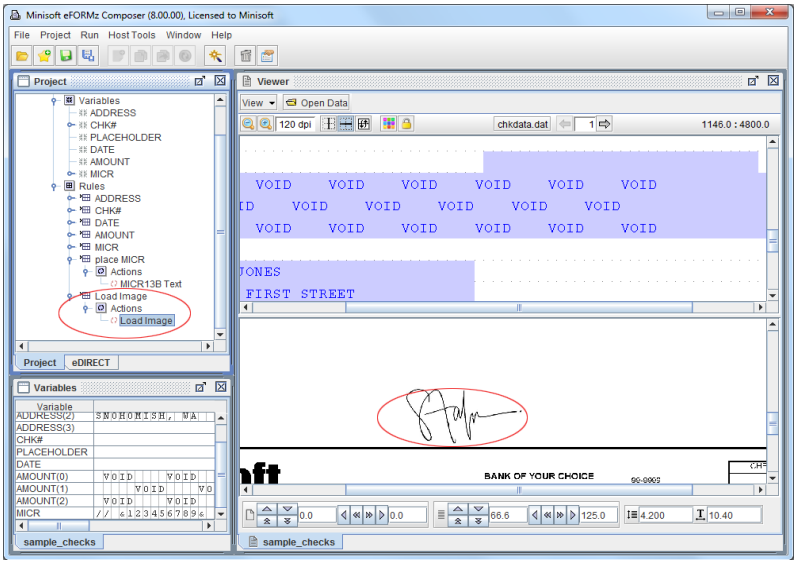
4. The Special Fonts Action dialog box will display, select *Position* > *Paste*. The position previously selected will appear in the Horizontal and Vertical fields.



Select *MICR13B* as the font type and click *OK*.

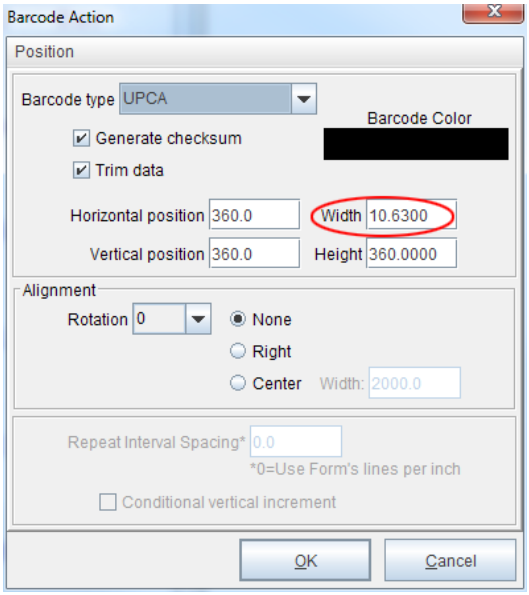
5. Once complete, the MICR line will display in the Form and Data Viewer. Using your mouse, position the MICR line into position.





Printing Barcodes to a Zebra Printer

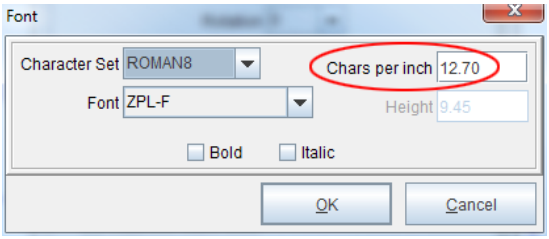
It is important to work backwards from the printer when setting the width of barcodes. ZPL printers are typically 203.2 dpi. For example, if the narrowest bar should be 3 dots, then the width in the Barcode Action should be set to 10.63 ((3 / 203.2) * 720). This way, what is seen in the eFORMz Composer will match what is printed.



Dpi	1	2	3	4	5
Width	3.5433	7.0866	10.6299	14.1732	17.7165

If the printer is not 203.2 dpi, plug the dpi into the following equation to determine the barcode width: ((dpi of narrowest bar / printer dpi) * decipoints per inch). For example, a 300 dpi printer where the narrowest bar should be 3 dots will have a barcode width of 7.2 ((3 / 300.0) * 720).

The same principle applies to fonts. For example, if ZPL Font F is being used and it needs to be printed at 1 times magnification, then the pitch (characters per inch) should be set to 12.7 (printer resolution / character width, or 203.2 / 16).



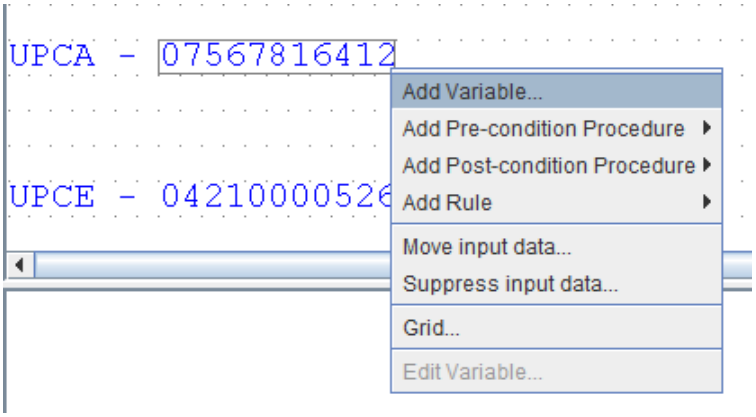
Font	*Width*	*x1*	*x2*	*x3*	*x4*
ZPL-A	6	33.87	16.93	11.29	8.47
ZPL-B	9	22.58	11.29	7.53	5.64
ZPL-C	12	16.93	8.47	5.64	4.23
ZPL-D	12	16.93	8.47	5.64	4.23
ZPL-E	20	10.16	5.08	3.39	2.54
ZPL-F	16	12.70	6.35	4.23	3.18
ZPL-G	48	4.23	2.12	1.41	1.06
ZPL-H	19	10.69	5.35	3.56	2.67

Again, if the printer is not 203.2 dpi, plug the dpi into the following equation to determine the barcode width: (printer resolution / character width). For example, if ZPL Font F is being used and it must be printed at 1 times magnification, then the pitch (characters per inch) should be set to 18.75 (300 / 16). If the magnification needs to be greater, divide by that magnification level. For example, if ZPL Font F is being used and it must be printed at 3 times magnification, divide by 3: (300 / 16 / 3). The pitch should be set to 6.25.

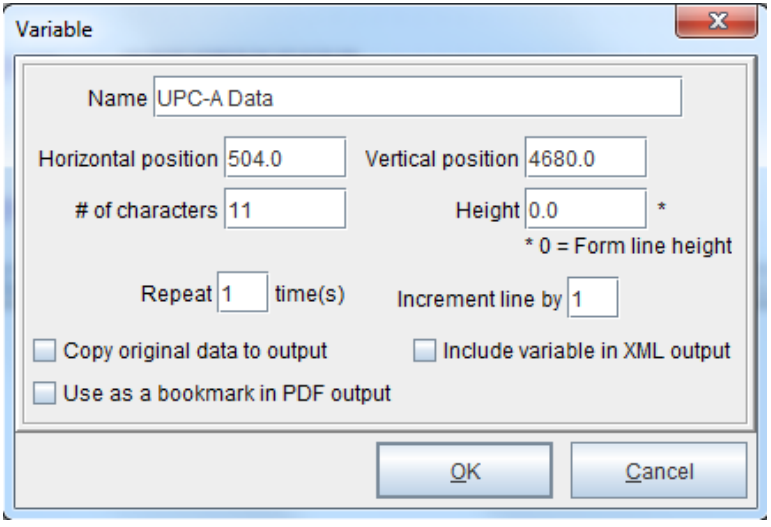
UPC-EAN Check Digit

If the data for a UPC-A, UPC-E, EAN8 or an EAN13 barcode doesn't have a check digit, it can be calculated within eFORMz. An example using a UPC-A barcode is shown below.

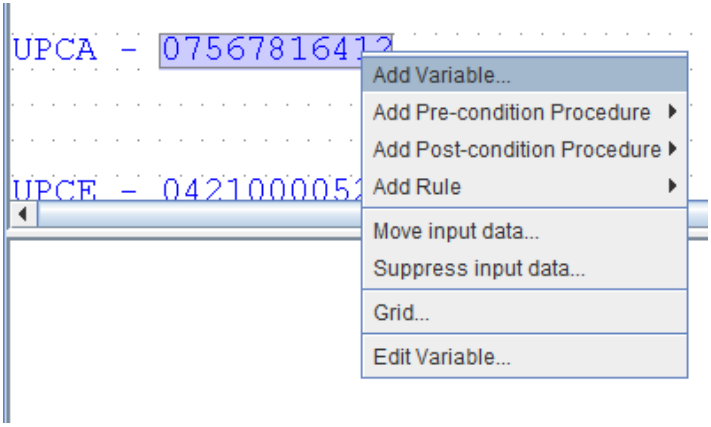
1. *Right click* the UPC-A data string and select *Add Variable*.



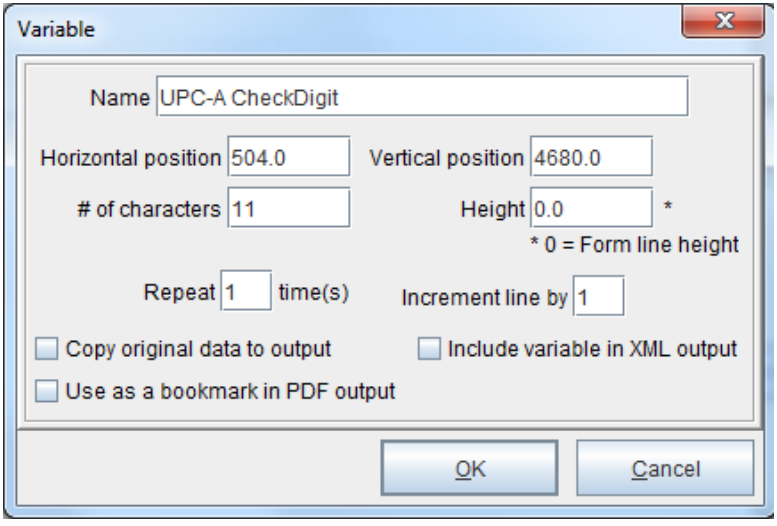
2. The Variable dialog box will display. Enter a name and click OK.



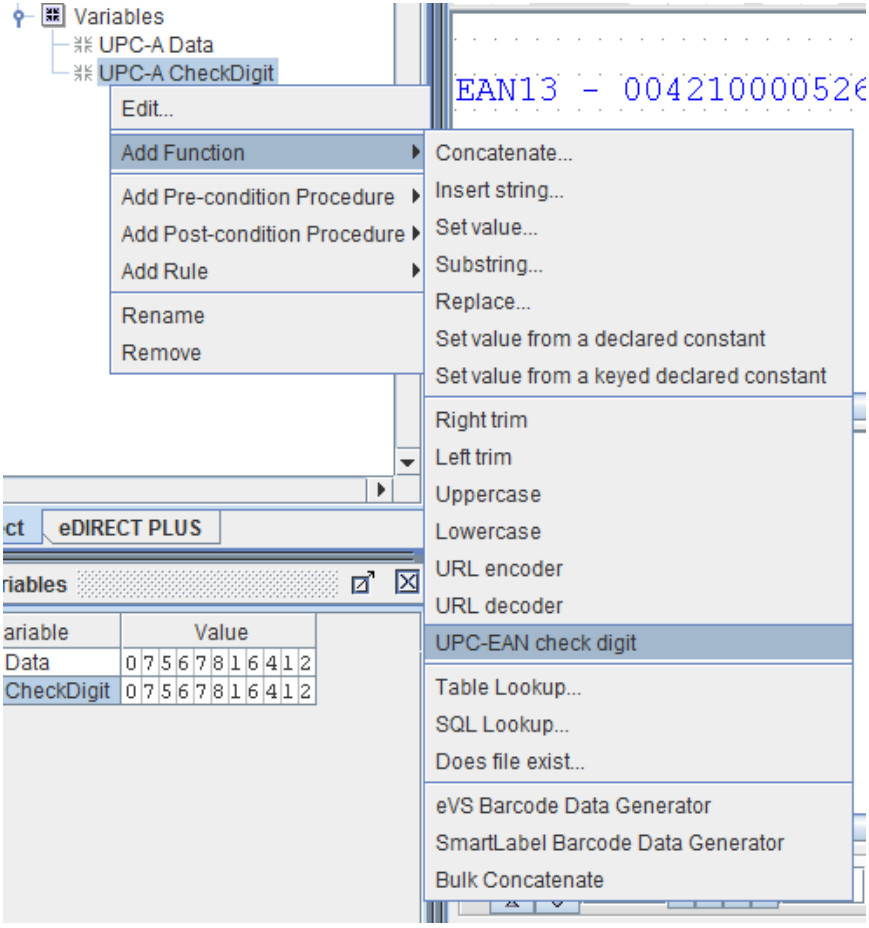
3. *Right click* the UPC-A data string again and select *Add Variable*.



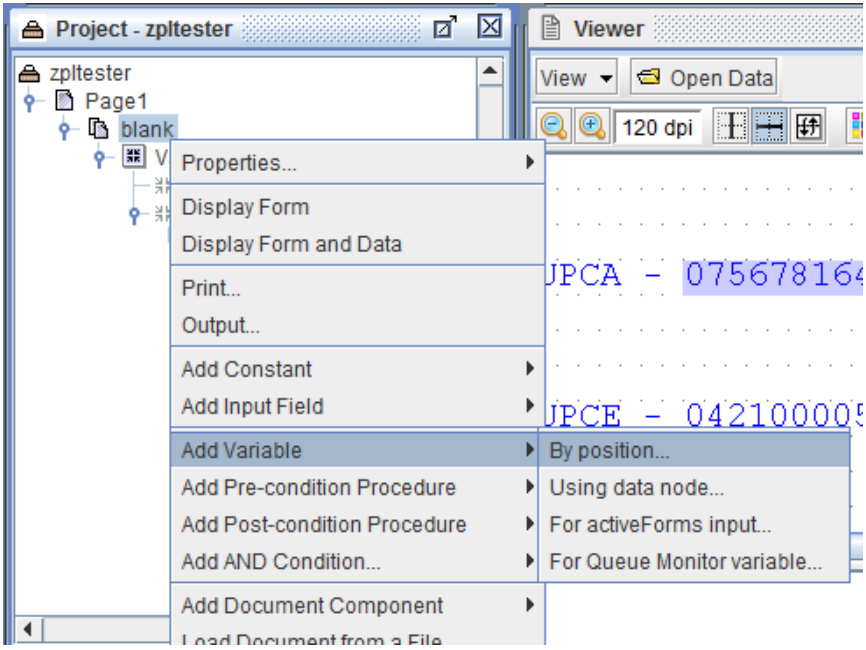
4. The Variable dialog box will display. Enter a name for the check digit and click OK.



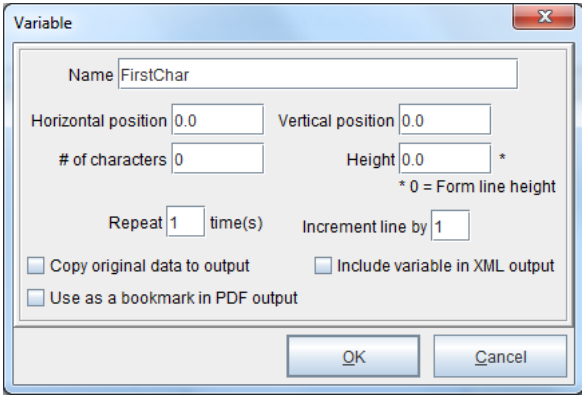
5. *Right click* the check digit Variable and select *Add Function* > *UPC-EAN check digit*.



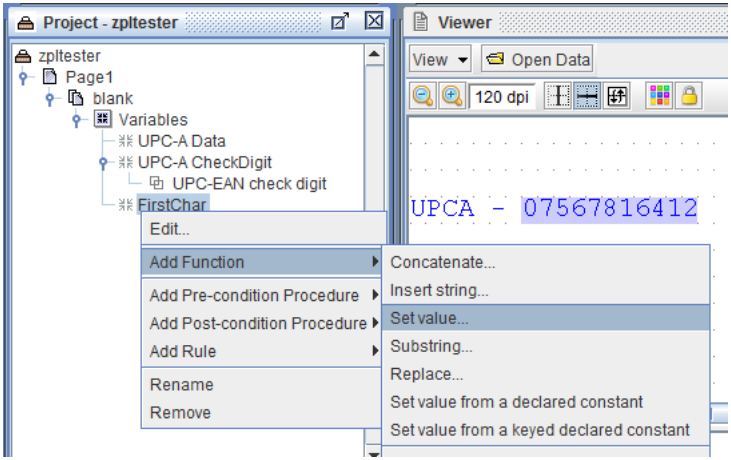
6. *Right click* the form and select *Add Variable* > *By position*.



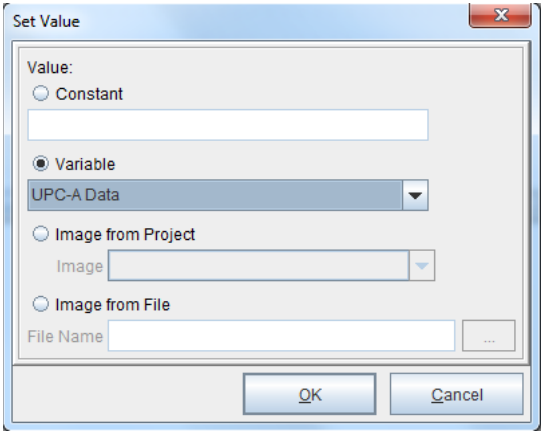
7. The Variable dialog box will display. Enter a name for the first text character of the UPC-A string. Click OK.



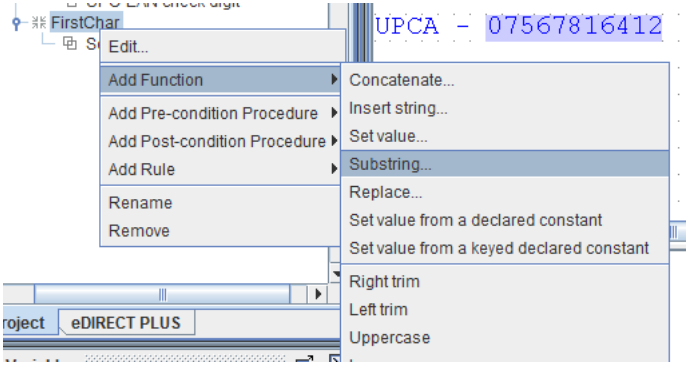
8. *Right click* the Variable and select *Add Function* > *Set value*.



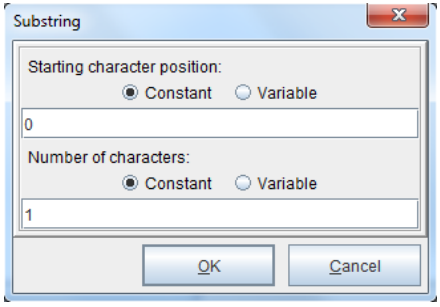
9. Select the Variable created for the UPC-A data from the *Variable* drop-down menu.



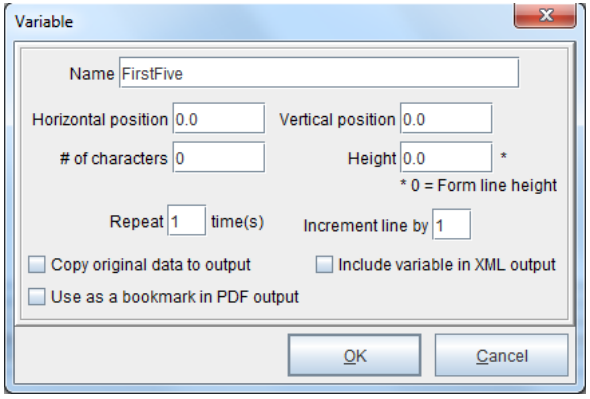
10. *Right click* the Variable and select *Add Function* > *Substring*.



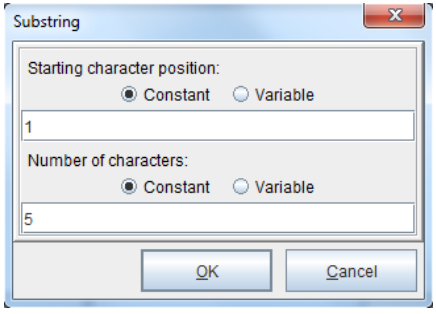
11. The starting character position should be 0, and it should span 1 character. This will set the Variable value to include only the first character of the UPC-A data string.



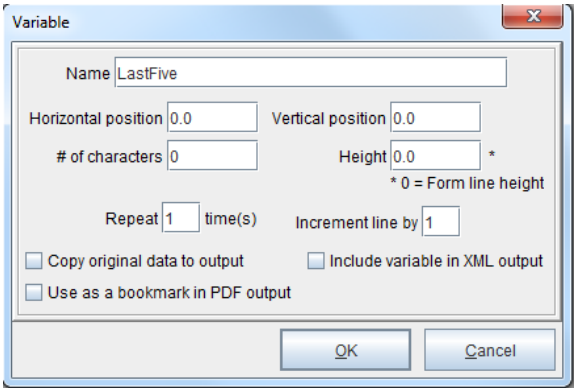
12. Create another Variable by position by *right clicking* the form and selecting *Add Variable* > *By position*. This Variable should be named for the next 5 text characters of the UPC-A string.



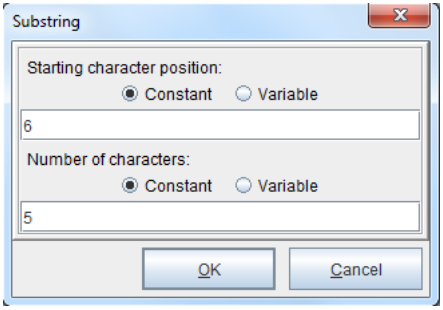
13. Like before, *right click* the Variable and select *Add Function* > *Set value*. Select the Variable created for the UPC-A data from the *Variable* drop-down menu. *Right click* the Variable and select *Add Function* > *Substring*. The starting character position should be 1, and it should span 5 characters. This will set the Variable value to include the second character through the sixth character of the UPC-A data string.



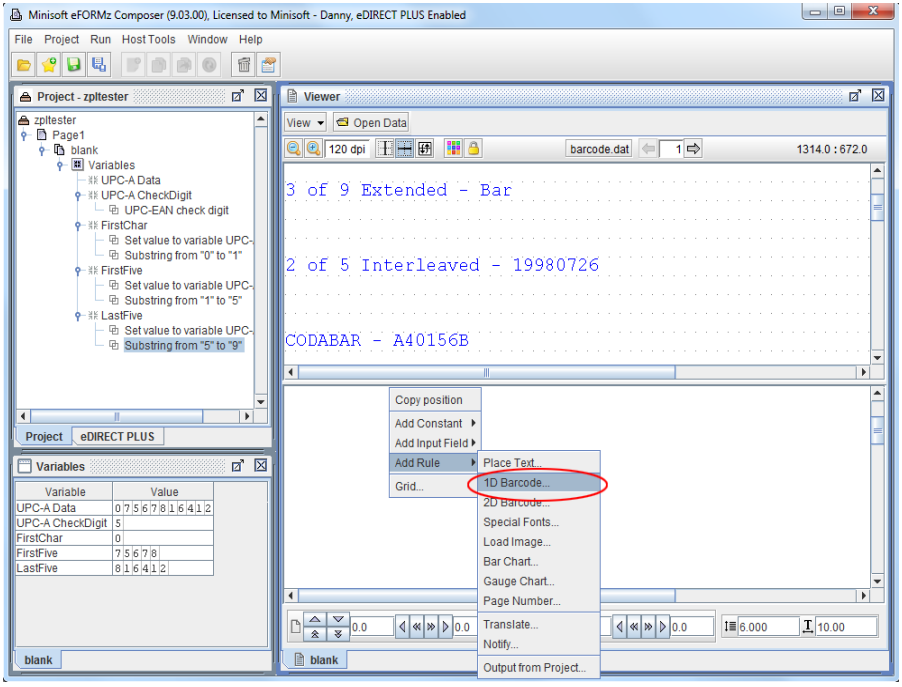
14. Add a Variable by position. Name the Variable for the last 5 text characters of the UPC-A data string.



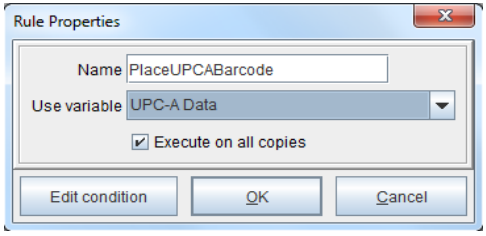
15. Again, *right click* the Variable and select *Add Function* > *Set value*. Select the Variable created for the UPC-A data from the *Variable* drop-down menu. *Right click* the Variable and select *Add Function* > *Substring*. The starting character position should be 6, and it should span 5 characters. This will set the Variable value to include the seventh character through the twelfth character of the UPC-A data string.



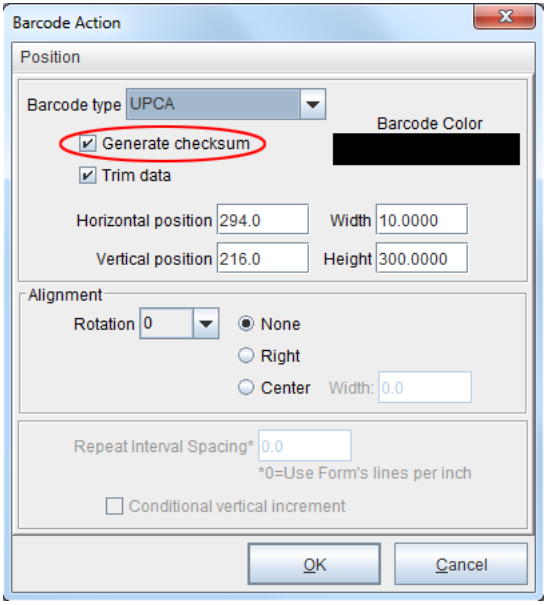
16. *Right click* in the Form Viewer and select *Add Rule > 1D Barcode*.



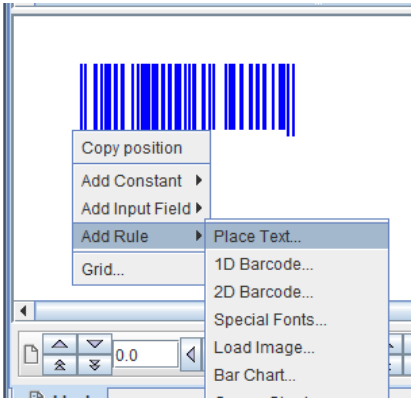
17. Select the Variable created for the UPC-A data from the *Use variable* drop-down menu.



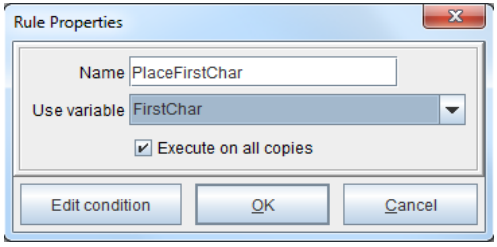
18. Select the 'UPCA' option from the *Barcode type* drop-down menu. Make sure that the *Generate checksum* box is checked. This generates the check digit for the barcode automatically. Click OK.



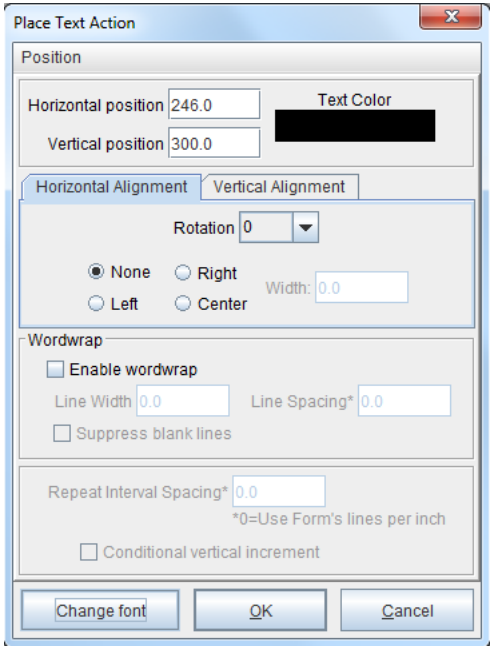
19. The barcode will display. *Right click* below the barcode and select *Add Rule* > *Place Text* to begin placing the text characters.



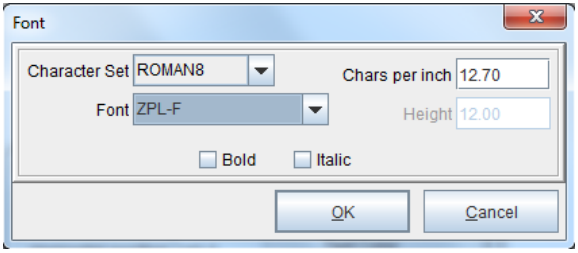
20. Select the Variable created earlier that contains the first character value from the *Use variable* drop-down menu.



21. The Place Text Action dialog box will display. Select the *Change font* button in the bottom left.

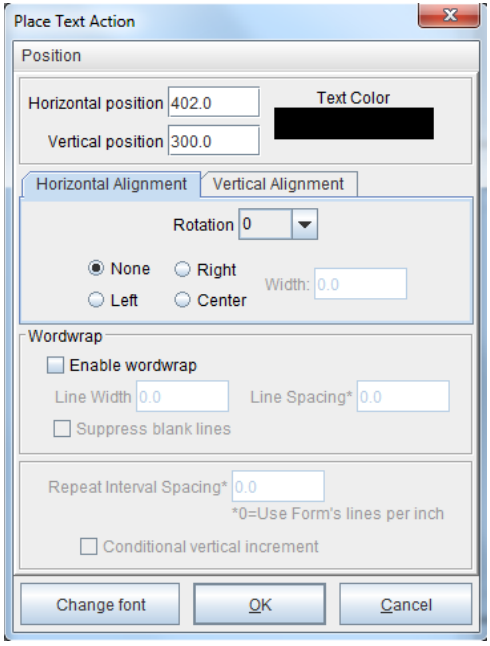


22. Set the appropriate font and characters per inch. Click OK.

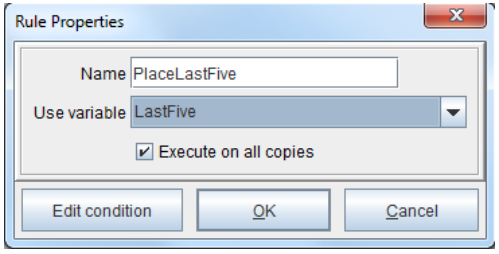


23. To add the next 5 characters, *right click* below the barcode and select *Add Rule* > *Place Text*. Select the Variable created earlier for the second through sixth characters of the UPC-A data string from the *Use variable* drop-down menu.

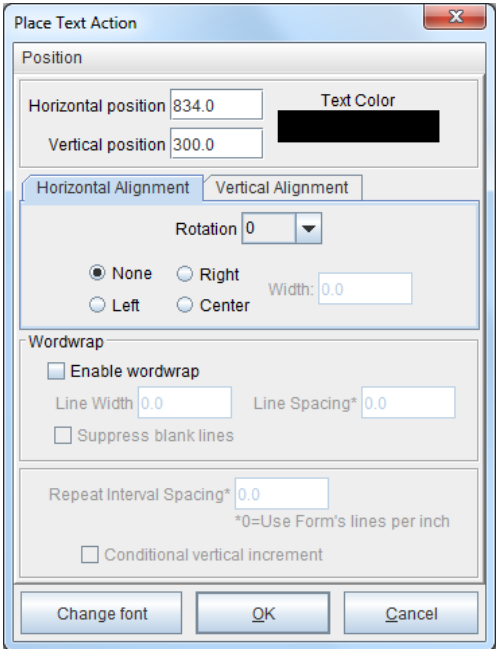
24. The Place Text Action dialog box will display. Make any necessary modifications to the font by selecting the *Change font* button in the bottom left. Click OK when complete.



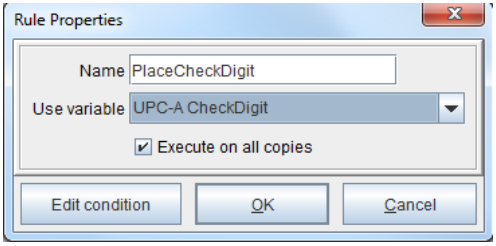
25. To add the final 5 characters, *right click* below the barcode and select *Add Rule* > *Place Text*. Select the Variable created earlier for the seventh through twelfth characters of the UPC-A data string from the *Use variable* drop-down menu.



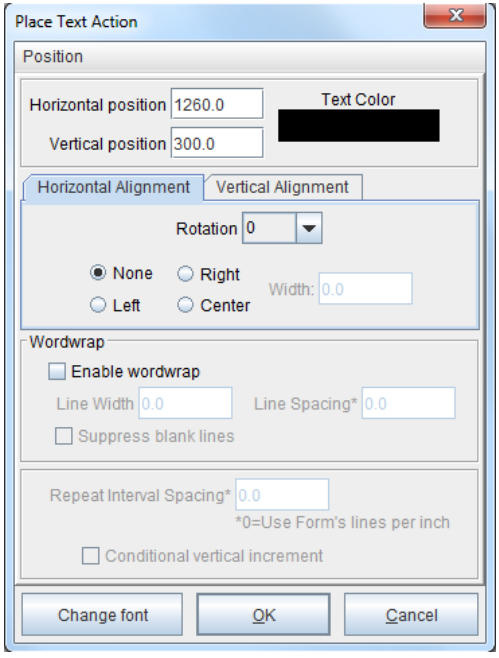
26. The Place Text Action dialog box will display. Make any necessary modifications to the font by selecting the *Change font* button in the bottom left. Click OK when complete.



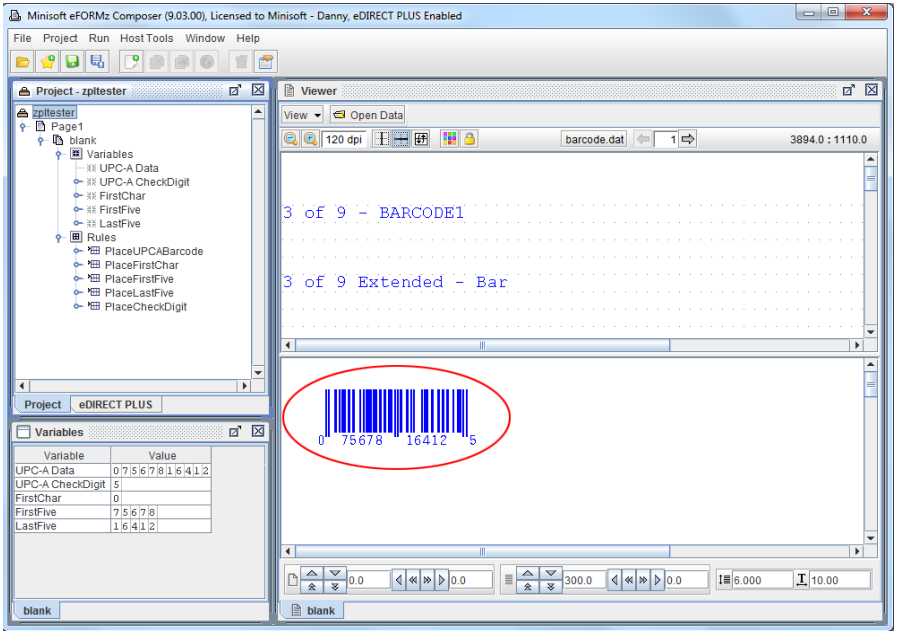
27. Finally, to add the check digit, *right click* below the barcode and select *Add Rule > Place Text*. Select the Variable created earlier for the check digit from the *Use variable* drop-down menu.



28. The Place Text Action dialog box will display. Make any necessary modifications to the font by selecting the *Change font* button in the bottom left. Click OK when complete.



29. The text characters of the UPC-A data string will display below the UPC-A barcode.



NOTE: In this instance, the data string for the UPC-A barcode is 07567816412, without a check digit present. The UPC-EAN check digit function calculated the check digit to be 5. To confirm this manually, first add the odd number digits: 0+5+7+1+4+2 = 19. Next, multiply the result by 3: 19 × 3 = 57. From there, add the even number digits: 7+6+8+6+1 = 28. Add the two results together: 57 + 28 = 85. To finish calculating the check digit, take the remainder of the result divided by 10 (85 / 10), and subtract from 10 (8.5 - 10). The result is -1.5. The quotient is 1 and the remainder is 5, so the check digit is 5.

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