

Linx 7900



How To Create Bar Codes



THINKING ALONG YOUR LINES



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1 Introduction

This document describes how you create and edit a bar code. The 7900 printer can generate the following bar code formats:

Format	Description
CODE 25	There is no character limit. Numeric only (0–9).
ITF	(Interleaved 2 of 5). Numeric only (0–9). The data can contain any even number of characters (which includes the checksum).
CODE 39	There is no character limit. The data must contain only upper case alphanumeric characters.
CODE 128	Full 128 ASCII character set. There is no character limit.
EAN-13	13 digits (12 + checksum). Numeric only (0–9).
EAN-8	8 digits (7 + checksum). Numeric only (0–9).
UPCA	12 digits (11 + checksum). Numeric only (0–9).
Data Matrix (ECC200)	A two-dimensional code of alphanumeric characters and punctuation symbols.
CODE 27	There is no character limit. Numeric (0-9) with additional stop/start characters.
Pharmacode	Numeric only (0-9). The data represents a single integer from 3 to 131070 in binary format, read from right to left.
Data Matrix (GS1-128)	A two-dimensional code of alphanumeric characters which contains additional information used to identify animal health products.

Figure 1. Bar code formats

You need a User Level C password to perform all the tasks described in this document.

1.1 Health and Safety

Make sure that you read and understand the Health and Safety information in the 'Safety' section of the *Linx 5900 & 7900 Quick Start Guide*.



2 Create a bar code

There are two methods that you can use to create a bar code:

- Edit an existing field and encode the field.
- Create a bar code field, then enter the source data or link the bar code to an existing field. See 'Encode several fields' on page 5.

Some of the steps that you perform are the same for both methods.

NOTE: You use the same method to create a bar code field or a Data Matrix field, but some of the menu options are different. You can find more information about Data Matrix fields on page 19.

2.1 Encode an existing field

For this example, a bar code is generated that uses the text field "ABC" in the following message.



Figure 2. Example message

The *Linx 5900 & 7900 Quick Start Guide* describes how you create a message like Figure 2, then select and edit a field. Perform the following steps to create the bar code for this field.

NOTE: You cannot use this method to combine more than one source field into a single bar code.

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- 1 At the **Message Editor** page (Figure 2 on page 3), select the text field "ABC". Then select **Edit > Options** to display the **Options** page for this field.

Figure 3. Options page

- 2 Select the **Encoding** option. The printer displays the **Encoding** page.

Figure 4. Encoding page

- 3 Select the **Format** option. The printer displays a list of bar the code formats that are available.

Figure 5. Format page



- 4 Use the Down arrow key to highlight the required format (for this example, select the Code 39 format). Press the **OK** key to return to the **Encoding** page.

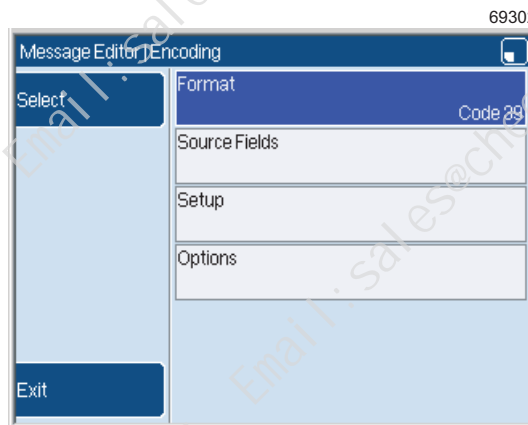


Figure 6. Encoding page

The other items in this page (**Source Fields**, **Setup**, and **Options**) are described in the next sections.

- 5 Press the **Exit** key three times to display the text field and the bar code.



Figure 7. Source field with bar code

2.2 Encode several fields

When you use this method, you select the source data after you create the encoded field.

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- 1 Create a new message in the Message Editor, or edit an existing message and put the cursor in an empty space. Make sure that no fields are selected.
- 2 At the **Message Editor** page, press the **Other Fields** key to display the **Insert Other Fields** page.

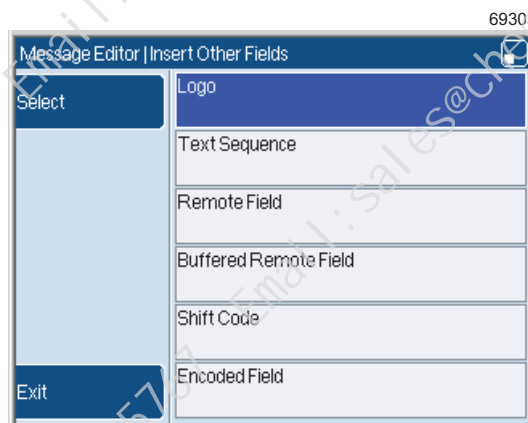


Figure 8. Insert Other Fields page

- 3 Select **Encoded Field** to display the **Options** page.

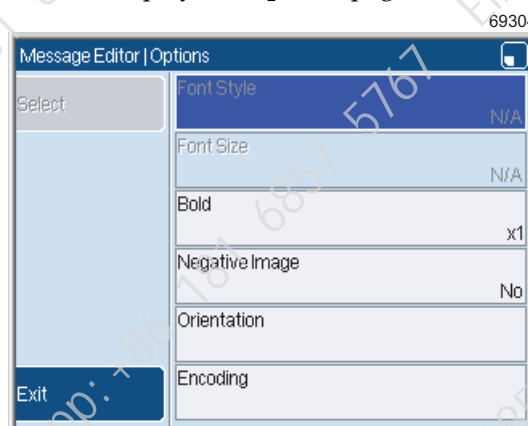


Figure 9. Options page

This page is like Figure 3 on page 4, but the **Font Style** and **Font Size** options are not available.



- 4 Select the **Encoding** option to display the **Encoding** page.

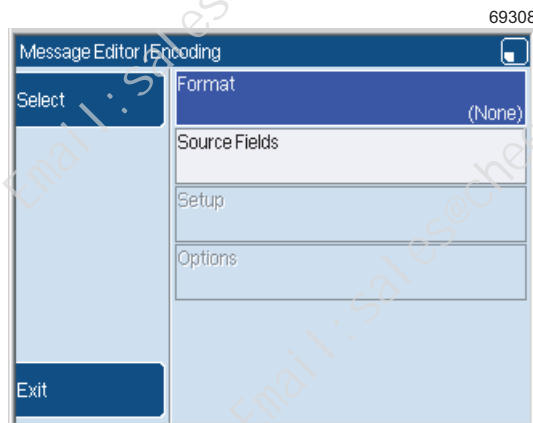


Figure 10. Encoding page: no format selected

This page is like Figure 6 on page 5, but only the **Format** and **Source Fields** options are available.

- 5 Select the **Format** option to display the format list.

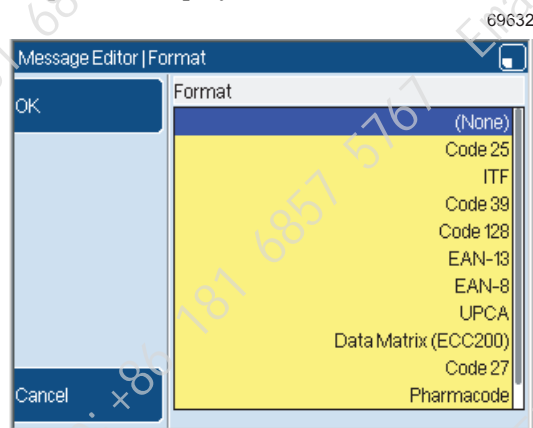


Figure 11. Format page

- 6 Select the Code 39 format then press the **OK** key to return to the **Encoding** page.

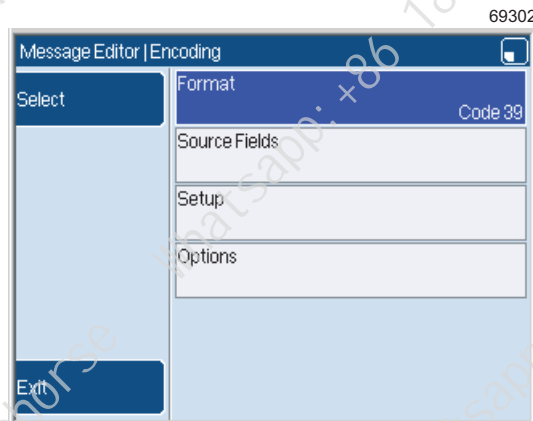


Figure 12. Encoding page



For descriptions of the other items in the **Encoding** page (**Setup** and **Options**), see 'Encoding Setup page' on page 11 and 'Encoding Options page' on page 15.

- 7 Select the **Source Fields** option to display the **Source Fields** page.

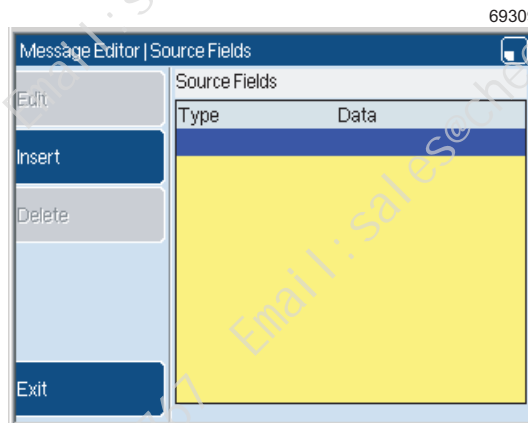


Figure 13. Source Fields page

- 8 Press the **Insert** key to display the **Field Type** page.

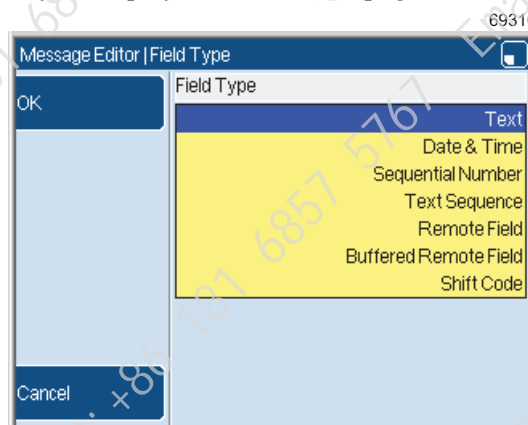


Figure 14. Field Type page

You can use this page to select any field format from the stores (except Text), or create a new format. To enter some text for the source data, select the **Text** option.

Some bar codes (see Figure 1 on page 2) cannot include any alphabetical or lower case characters. For these formats, the text must contain only numeric characters.

- 9 Use the arrow keys to highlight the required field type, then press the **OK** key. The printer displays an 'Insert' page that depends on the field type that you selected.



For example, if you select the Date & Time field type from the list, the printer displays the **Insert Date & Time** page.

Figure 15. Insert Date & Time page

NOTE: There is no **Options** item on this page.

You use the page that is shown in Figure 15 to add a Date & Time *format* into a *bar code*. When you insert a Date & Time *field* into a *message*, the **Insert Date & Time** page has the **Options** item.

The **Options** item is not present in the pages that you use to insert other field types into a bar code (for example, Text, or Shift Code).

- 10 Use the options on the 'Insert' page to create and configure the field as necessary. (The 'Insert' page is different for each field type.)
- 11 When your changes in the 'Insert' page are complete, press the **Exit** key to return to the **Source Fields** page. In Figure 16, a Date & Time field was inserted and the format of this field is "HH:MM.SS".

Figure 16. Source Fields: Date & Time field



- 12 Press the **Insert** key to insert another field if necessary. For example in Figure 17 the encoded field has three source fields.

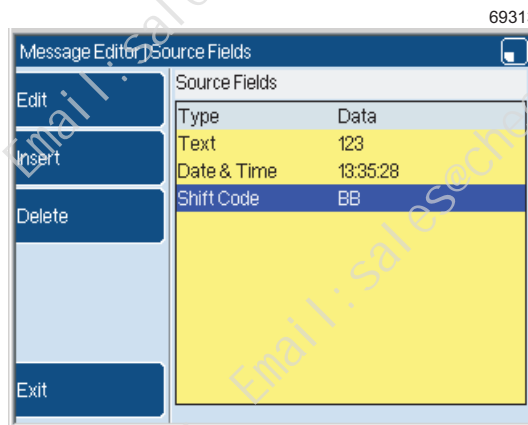


Figure 17. Source Fields page: three fields

- 13 Press the **Edit** key to change the highlighted field, or press the **Delete** key to delete the field.

To move a field to a different position:

- Use the arrow keys to highlight the field.
- Press the [alt] key and the Up or Down arrow key together to move the field to the required position.

- 14 When your changes are complete, press the **Exit** key three times to return to the **Message Editor** page. The printer displays the completed bar code.

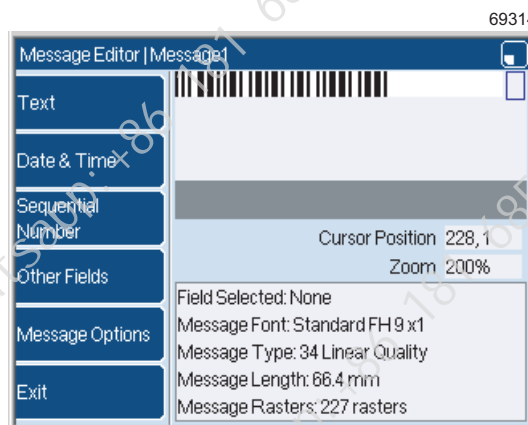


Figure 18. Message Editor page and bar code

In Figure 18 only a part of the code is visible—press the **Home** key to see the start of the code.



2.3 Encoding Setup page

At the **Encoding** page, highlight **Setup** and press the **Select** key to display the **Encoding Setup** page.

Message Editor Encoding Setup	
Select	Height 8
	Display Integrated Text No
	Checksum Yes
	Quiet Space Yes
Exit	

Figure 19. Encoding Setup page (bar code)

The options that are displayed depend on the bar code format that you selected. The Code 128 version is as shown below.

Message Editor Encoding Setup	
Select	Height 8
	Checksum Yes
	Code 128 Data Default (ASCII)
	Quiet Space Yes
Exit	

Figure 20. Encoding Setup page: Code 128



The **Code 128 Data** option displays a page that allows you to define the type of data that is encoded, as shown below.

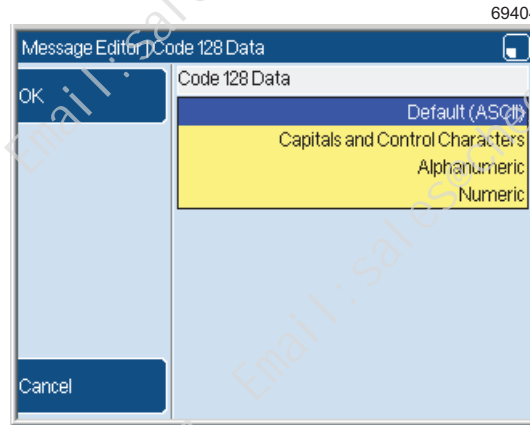


Figure 21. Code 128 Data page

Select the data type that is correct for your data. The printer uses this information to calculate the length of the bar code symbol.

NOTE: If you do not use the Default (ASCII) data type, the printer can generate very long bar code symbols.

The **Encoding Setup** page for a Data Matrix field is as shown below. The only menu option is the **Size** option.

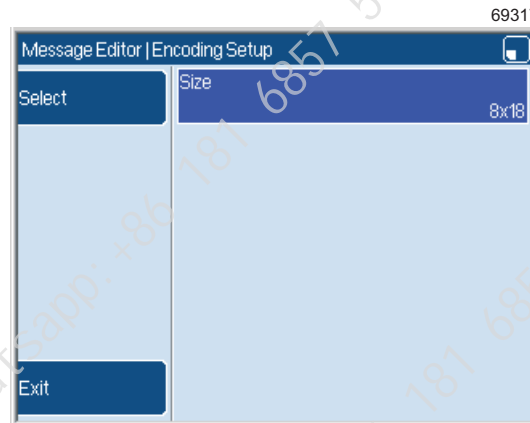


Figure 22. Encoding Setup page (Data Matrix)

The options on the **Encoding Setup** pages are as follows.

2.3.1 Height

You can set the height of the bar code (the number of ink drops). The maximum height depends on the printhead type. The maximum height of the bar code is the height of the largest message type that you can print.

2.3.2 Display Integrated Text

You can use the **Display Integrated Text** setup option with the bar code types EAN-13, EAN-8, or UPCA.



If you set this option to Yes, the printer displays the bar code text with the bars.

Figure 23 (a) shows a bar code with the option set to No. Figure 23 (b) shows the same bar code with the option set to Yes.



Figure 23. Integrated Text

2.3.3 Checksum

You can set bar code types Code 25, ITF, and Code 39 to include a checksum. If you set the **Checksum** option to Yes, the bar code includes a checksum.

The bar code types Code 128, EAN-13, EAN-8, and UPCA always include a checksum.

The Data Matrix (ECC200) bar code type includes error checks within the code.

2.3.4 Quiet Space

If you set this option to Yes, the printer inserts a blank area at each end of the bar code. The blank areas improve the accuracy of the scanning process.

2.3.5 Size

When you create a Data Matrix field, use this option to set the number of rows and columns in the field. The printer displays a list of the available sizes, which are shown in Figure 30 on page 20.



2.3.6 Aspect Ratio

When you select the Code 39 or ITF bar code formats, the **Aspect Ratio** option becomes available.

The screenshot shows a software interface titled 'Message Editor | Encoding Setup'. On the left is a 'Select' menu with 'Exit' at the bottom. The main area displays several settings: 'Height' is 8, 'Display Integrated Text' is No, 'Checksum' is Yes, 'Quiet Space' is Yes, and 'Aspect Ratio' is 12. The 'Aspect Ratio' row is highlighted in blue.

Figure 24. Encoding Setup page (Aspect Ratio option)

This option defines the difference in size between the narrow and wide lines of the bar code. The values are the ratio of vertical lines (rasters) that make up the narrow and wide lines in the bar code. The options available are as follows:

	Narrow	Wide
1:2	One vertical line	Two vertical lines
1:3	One vertical line	Three vertical lines
2:5	Two vertical lines	Five vertical lines
3:8	Three vertical lines	Eight vertical lines

The default option is 1:2.



2.4 Encoding Options page

At the **Encoding** page, highlight **Options** and press the **Select** key to display the **Encoding Options** page.

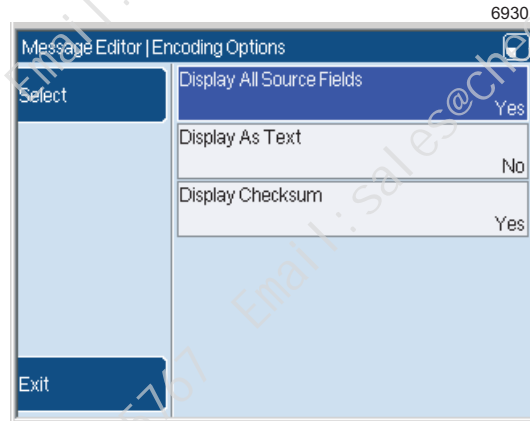


Figure 25. Encoding Options page: Code 25

The options that are displayed depend on the bar code format that you selected.

2.4.1 Display All Source Fields

If you set this option to Yes, all of the source fields are displayed in the message. If the bar code contains a number of source fields, each source field is a separate field (see Figure 26 on page 16).

NOTE: This option is only available if source fields are not displayed in the existing message.

2.4.2 Display As Text

If you set this option to Yes, the printer adds a text field below the bar code symbol. The text field is a single field that includes all the source data for the bar code. If the checksum is displayed, it is the last character in the text field (see Figure 26 on page 16).

2.4.3 Display Checksum

If the bar code includes a checksum, and you set this option to Yes, the bar code text includes the checksum character. If the checksum character is not in the range of characters that the printer can print, a square box is printed. (For example, the printer cannot print the ASCII character 27 ('ESC').)



Figure 26 shows an EAN-13 bar code with the following options set to Yes:

- **Display Integrated Text**
- **Display All Source Fields**
- **Display As Text**
- **Display Checksum**



Figure 26. EAN-13 bar code example

Figure 26 shows an EAN-13 bar code symbol (A) that contains the data from three text fields ("1234", "5678" and "9012"). The bar code encodes the fields as a single 12-digit number "123456789012".

- Because the **Display Integrated Text** option is set to Yes, the printer displays the 12-digit number (B) in the bar code symbol. The additional digit ("8") in this number is the checksum character.
- Because the **Display All Source Fields** option is set to Yes, the printer displays the source fields (D, E, F) next to the symbol. The lines with dashes in the figure indicate that the fields are separate. You can select and edit each one separately.
- Because the **Display As Text** option is set to Yes, the printer also shows the 12-digit number (C) under the bar code symbol. This field is a single field that contains all three text fields. You can move this field if necessary.
- Because the **Display Checksum** option is set to Yes by default, the number (C) includes the checksum character "8".



The following table shows the options that are available for each type of bar code (N/A indicates that the option is not available).

7900 BAR CODE FORMATS AND PARAMETERS										
Format	Code 25	ITF	Code 39	Code 128	EAN 13	EAN 8	UPCA	Data Matrix	Code 27	Pharma-code
Setup page:										
Display Integrated Text	No	No	No	No	Yes	Yes	Yes	No	No	No
Checksum	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	N/A	N/A
Quiet Space	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	N/A
Aspect Ratio	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Options page:										
Display All Source Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display As Text	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display Checksum	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No

Figure 27. Bar code parameter availability



3 Data Matrix

3.1 About Data Matrix

A Data Matrix code operates like a normal bar code but the information is contained in a pattern of dots in a square or rectangle.



Figure 28. Data Matrix example

The size and shape of the Data Matrix code depends on the selected format.

NOTE: Linear Flexible message types print the most accurate Data Matrix fields. You can also use Linear Quality message types with the Midi Plus printhead.

The *2-D Dot Codes User Guide* (part number FA65210) contains more information about Data Matrix codes.

Figure 29 shows an example of a completed Data Matrix code that contains data from a text field and a Date & Time field.

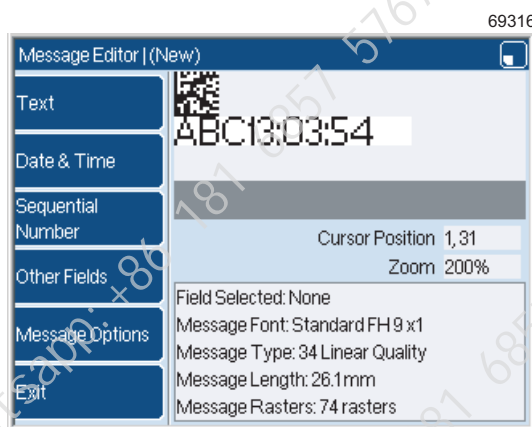


Figure 29. Data Matrix field with source data



3.2 Data Matrix fields

You use the same method to create a bar code field or a Data Matrix field, but some of the menu options are different.

3.2.1 Source data

You can use one Data Matrix field to encode any number of text items. The text items can be any of the following field types:

- Text
- Date and Time
- Sequential number
- Text sequence
- Remote field

3.2.2 Code Size

The 7900 printer can generate ECC 200 Data Matrix fields in 16 different sizes. Figure 30 on page 20 shows the available sizes.

If the height of the Data Matrix field is greater than the height of the Message Type, a warning message is displayed. If the Data Matrix field is large, the field can be on top of the displayed text. Move the field or the text to remove the problem.



3.2.3 Encoding capacity

The capacity of the Data Matrix field depends on the size, as shown in Figure 30. If the amount of encoded data is greater than the capacity, the printer displays an empty box instead of the field. Increase the size of the field or decrease the amount of data.

NOTE: The Data Matrix format uses some capacity for error correction. Figure 30 shows the maximum available capacity for numeric, alphanumeric, or binary data for each symbol size. The printer sets the encoding mode automatically for the type of data included in the symbol.

ECC 200 DATA MATRIX				
Symbol size		Capacity		
Rows	Columns	Numeric	Alphanumeric	8-bit byte
10	10	6	3	1
12	12	10	6	3
14	14	16	10	6
16	16	25	16	10
18	18	36	25	16
20	20	44	31	20
22	22	60	43	28
24	24	72	52	34
26	26	88	64	42
32	32	124	91	60
Rectangular Symbols				
8	18	10	6	3
8	32	20	13	8
12	26	32	22	14
12	36	44	31	20
16	36	64	46	30
16	48	98	72	47

Figure 30. Data Matrix sizes

The Data Matrix field can use a number of standard methods to encode the source data. The method that is used depends on the type of source data.

3.2.4 Remote fields

If the source data includes a remote field, the printer examines the format of the received data. The data type is alphanumeric unless the field contains only numeric data. Make sure that the received data contains the correct data type. If the data type is not correct, the printer displays an empty box instead of the Data Matrix symbol.



3.3 Data Matrix (GS1-128)

The 7900 printer can create a Data Matrix in GS1-128 format, a standard code used to identify animal health products. This format uses a 14-digit number to identify products at different levels of packaging. See Figure 31 for an example of a Data Matrix (GS1-128) code generated from the data shown in Figure 33 on page 22.

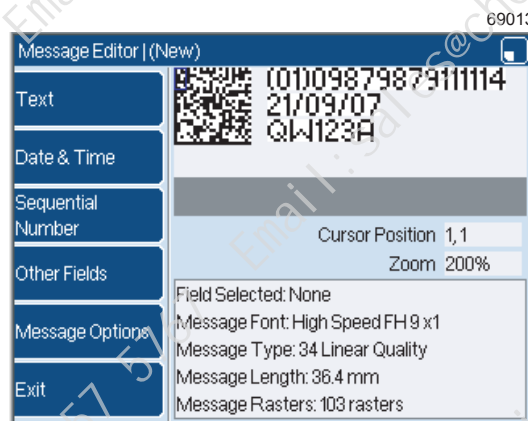


Figure 31. Data Matrix (GS1-128) field with source data

To create a Data Matrix in GS1-128 format:

- 1 From the **Encoding** page, select the Data Matrix (GS1-128) format from the **Format** option (see Figure 11 on page 7). When you use the Data Matrix (GS1-128) format for the first time, the **Data Matrix (GS1-128): Company Prefix** page is displayed.

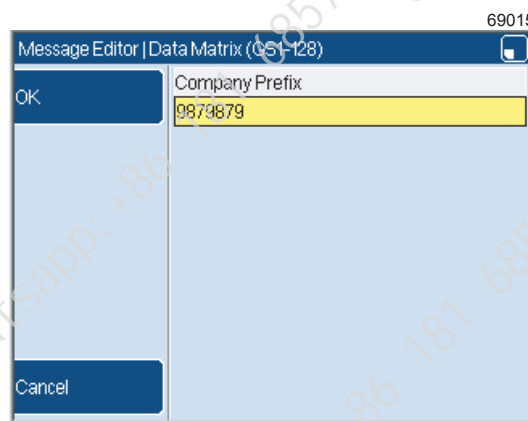


Figure 32. Data Matrix (GS1-128): Company Prefix page

- 2 The company prefix is a seven-digit number that identifies a given company by its Global Trade Item Number (GTIN) prefix.
Enter the required prefix. When you enter a prefix it is saved, but, if necessary, you can edit it in the **Company Prefix** option (see below).



- 3 Press the **OK** key to display the **Data Matrix (GS1-128): Source Fields** page where you enter the information required to create the Data Matrix.

Figure 33. Data Matrix (GS1-128): Source Fields page

The options are as follows:

- **Packaging Level**—the packaging level defaults to '0'. This number identifies the level of packaging of an item. For example '0' indicates a single item, '1' indicates a box of ten items, and '9' indicates a variable quantity of an item.

NOTE: At present you can only use a packaging level of '0' (that is a single item) on the 7900 printer.

- **Company Prefix**—entered on the previous page. Users with a User Level C password or above can edit the prefix.
- **Item Number**—a five-digit number that identifies an item by its catalogue number. Each item is allocated a different number.
- **Expiry Date**—the expiry date of an item. Select this option to display the **Data Matrix (GS1-128): Format** page. When you use the Data Matrix (GS1-128) format for the first time you must select an expiry date format

Figure 34. Data Matrix (GS1-128): Format page



Select the required date format (for example dd/mm/yy) and press the **OK** key. The **Data Matrix (GS1-128): Expiry Date** page is displayed.

Select	Day Of Month
	21
	Month 09
	Year 07
	Display Months As Text No
	Format 21/09/07
Exit	

Figure 35. Data Matrix (GS1-128): Expiry Date page

The **Expiry Date** page options are as follows:

- **Day of Month**—enter the day (in the range 01 to 31). You can only enter a valid number for the day of month.
- **Month**—enter the month (in the range 01 to 12). You can only enter a valid number for the month.
- **Year**—enter the year (in the range 00 to 99). You can only enter a valid number for the year.
- **Display Months As Text**—if set to Yes, the selected month is displayed as text (for example 21/09/07 becomes 21/SEP/07, as shown in Figure 36). The option defaults to No.

Select	Day Of Month
	21
	Month 09
	Year 07
	Display Months As Text Yes
	Format 21/SEP/07
Exit	

Figure 36. Data Matrix (GS1-128): Expiry Date page with month displayed as text

- **Format**—shows the date in the selected format. If you select this option, the **Data Matrix (GS1-128): Format** page is displayed.

NOTE: Some of the above options are not available for all expiry date formats.

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Enter the required information for each option and press the **Exit** key to return to the **Data Matrix (GS1-128): Source Fields** page.

- **Batch Number**—the batch number of an item in alphanumeric format. The batch number can be 1 to 20 characters in length.
- 4 Enter the required information for the above options and press the **Exit** key to return to the **Encoding** page. You can select the **Source Fields** option to edit any information entered

NOTE: Data Matrix (GS1-128) fields are 24 rows by 24 columns in size by default. You cannot change the size of the Data Matrix from the **Setup** option on the **Encoding** page.

- 5 Press the **Exit** key two times to return to the **Message Editor** page. The printer displays the completed Data Matrix as shown in Figure 31 on page 21.