Honeywell

IPL Command Reference

User Guide

Honeywell

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IPL COMMAND REFERENCE

Intermec Printer Language (IPL) is an easy-to-use programming language that lets you:

- design formats (templates) for barcode labels, download formats to the printer, or modify formats stored in the printer.

- download data to fill in a barcode label (or RFID tag information) and print the label.

- enable or disable printer features and options, or abort print jobs and reset the printer.

- query the printer for hardware diagnostic data and status of print jobs.

This manual also provides information about how to use IPL to develop applications for your Honeywell printer.

Supported Printers

Printer Type	Printer Model
Mobile	RP2f, RP4f
Desktop	OT810, OT820, PC23d, PC42d, PC42t, PC42E-T, PC43d, PC43K, PC43t, PC45d, PC45t, PC300T, PC310T
Industrial	PD43, PD43c, PD45, PD45S, PM23c, PM42, PM43, PM43c, PM45, PM45c, PM65, PX240, PX240S, PX940A, PX940V, PX4ie, PX6ie

How to Find Commands in This Manual

The IPL commands in this manual are listed:

- alphabetically by name.
- alphabetically by command syntax.
- in groups by command type.

About IPL Command Types

There are six types of IPL commands.

Commands	Description
Communications Commands	Set printer communications parameters.
Configuration Commands	Enable or disable printer features and options. For RFID, use Configuration commands to determine how the RFID tags interact with the printer. To use Configuration commands, the printer must be in Print operating mode.
Immediate Commands	Get status information from the printer, reset the printer, or stop print jobs. To use Immediate commands, the printer can be in any operating mode.
Print Commands	Use these commands to download data to the printer and print barcode labels. For RFID, use Print commands to write data to and read data from RFID tags and to print RFID tag labels. To use Print commands, the printer must be in Print operating mode.
Program Mode Commands	Use these commands to design barcode label formats. RFID program mode commands create and define data sources for tag fields. To use these commands, the printer must be in Program operating mode.
Test and Service Commands	Use these commands to get diagnostic information from the printer when troubleshooting or configuring the printer.To use these commands, the printer must be in Test and Service operating mode.

Print Labels with IPL Commands

This procedue describes the basic process for printing barcode labels using IPL.

To print barcode labels

1. Use IPL commands to design the format for the barcode label. If you do not specify a format, the printer assumes you want to use the default format (format 0), which is stored permanently in the printer. The printer prints the label using that format.

2. Send the format to the printer as a series of IPL command strings. The printer stores the format in memory. You can store multiple formats on your printer.

3. Send a command string to the printer that specifies the data for the fields of the format, and then prints the label.

It is not always necessary to send the format and the data to the printer separately. You can send fixed data formats or even variable data formats that include the data in the same file.

See Also:

[Format, Create or Edit command](#)

IPL Command String Structure

An IPL command string is a text string that you send to the printer. A command string is a combination of ASCII control codes (or their readable equivalents), the syntax for the specific command, and associated data.

Example

A simple command string can look like this:

<STX>E2;F2;T4<ETX>

where:

<STX>	is the readable equivalent of the start of text character. Command strings must always begin with the start of text ASCII command code or its equivalent in readable characters. Readable characters must be enclosed in angle brackets.
E2	is the syntax and data for the Format, Erase command.
;	is the command terminator character. Use ; to separate commands and associated data.
F2	is the syntax and data for the Format, Create or Edit command.
T4	is the syntax and data for the Bitmap User-Defined Font, Clear or Define command. Because this is the last command in the string, you do not need to follow it with ;.
<ETX>	is the readable equivalent of the end of text character. Command strings must always end with the end of text ASCII character or its equivalent in readable characters. Readable characters must be enclosed in angle brackets.

Note: *All command syntax is case sensitive.*

See Also:

How to Use ASCII Control Characters

How to Use ASCII Control Characters

Command strings always include ASCII control characters. To use ASCII control characters, you can:

- enter a control code. Some word processing programs allow you to represent ASCII control characters by entering the appropriate control code.

- type the readable characters. Instead of control codes, you type the appropriate string of characters enclosed in angle brackets.

For example, an IPL command string must begin with the start of text control character. The control code for this character is 0x02 (hex notation, also represented by ^B in some text editing programs), and the readable characters for this control code are <STX>.

These examples show a command string written with readable characters and with control codes:

Type	Command String
Readable characters:	<STX><SI>g1,567<ETX>
Control codes:	ˆBˆOg1,567ˆC

For a list of ASCII control characters, control codes, and definitions, see the Full ASCII Control Characters Table.

If the start of text character is the actual control code, all other control characters in the same command string must be in control code format. The printer ignores any control characters represented by readable characters.

Conversely, if the start of text character is represented by readable characters (<STX>), all other control characters in the same string must be represented by readable characters. The printer ignores any control characters represented by control codes.

For simplicity, this manual uses readable characters in all examples and syntax.

Using readable characters consumes more memory space and takes more time to process, but each command string is more easily read and edited.

Create Command Strings

IPL command strings can be as long as needed to perform a task.

Example

This series of short command strings creates and defines a label format:

```
<STX><ESC>P<ETX>
<STX>E3;F3;<ETX>
<STX>H0;o81,100;f0;c0;d0,16;h1;w1;<ETX>
<STX>H1;o81,120;f0;c0;d0,16;h1;w1;<ETX>
<STX>H2;o81,150;f0;c2;d0,14;h1;w1;<ETX>
<STX>H3;o81,190;f0;c2;d0,16;h1;w1;<ETX>
<STX>B4;o81,0;f0;c0,1;h50;w1;d0,11;i0;p@;<ETX>
<STX>R<ETX>
```

This longer command string combines all eight of the previous command strings into a single string:

```
<STX><ESC>P;E3;F3;H0;o81,100;f0;c0;d0,16;h1;w1;H1;o81,120;f0;c0;
d0,16;h1;w1;H2;o81,150;f0;c2;d0,14;h1;w1;H3;o81,190;f0;c2;d0,16;
h1;w1;B4;o81,0;f0;c0,1;h50;w1;d0,11;i0;p@; R<ETX>
```

The printer interprets each example the same way.

After you determine the IPL command strings you need to accomplish a task, save the strings as an ASCII text file for future use.

To create a text file of IPL command strings

1. Determine the IPL command strings you need to accomplish a task.

2. Open a text editor or word processor and type the command strings.

3. Save the file as an ASCII text file.

See Also:

[How to Design Barcode Labels](#)

Send IPL Commands to the Printer

You can send IPL commands to the printer using a communications program, like HyperTerminal (Windows XP or earlier) or Windows Remote Shell (Windows Vista or Windows 7).

This procedure describes how to connect the printer to a PC and send a text file of IPL command strings to the printer using HyperTerminal.

To send a text file of IPL commands to the printer

1. Connect the printer to the serial port (COM1) on your desktop PC. For more information, see your printer user manual.

2. On the desktop PC, start the HyperTerminal application.

3. Configure the HyperTerminal connection settings to match the serial communications parameters of your printer.

   If you receive the "write fault error" error message, it indicates that either you are sending the data to the wrong COM port, or your cable does not support hardware flow control.

4. From the Main menu bar, select **Transfer**.

5. Select **Transfer** > **Send Text File**.

6. From the **Transfer** list box, select **Send Text File**.

HyperTerminal sends the .txt file to your printer. Your command text file either changes a configuration setting in the printer or prints your label format.

Switch Between Printer Operating Modes

When you send IPL commands to the printer, make sure the printer is in the correct operating mode to interpret those commands:

- Use Print operating mode to send print or configuration commands. You also use Print mode to print labels, download fonts, and upload information from an RFID tag.

- Use Program mode to send program commands. You also use Program mode to define formats, pages, fonts, and characters.

- Use Test and Service mode to send test and service commands. You can also use Test and Service mode for hardware diagnostic information.

For advanced printer programming, you can use secondary printer modes. For more information, see About Secondary Printer Modes.

To place a printer in Program mode

- Send this command string:

    <STX><ESC>P<ETX>

Send this command every time that you download formats, even if you think the printer is already in Program mode. If the printer is already in Program mode, it ignores this command.

To place a printer in Print mode

- Send this command string:

    <STX>R<ETX>

Send this command before each set of data or as your last format command. If the printer is already in Print mode, it ignores this command.

The R command may be treated as data if the data to the printer does not include a <CAN> or field pointer to clear the fields.

To place a printer in Test and Service mode

- Send this command string:

    <STX><ESC>T<ETX>

Send this command before any test and service commands. Typically, you will not need to use test and service commands when defining label formats.

See Also:

[Print Commands](#)

[Program Mode Commands](#)

[Test and Service Commands](#)

[About Secondary Printer Modes](#)

HOW TO DESIGN BARCODE LABELS

To print a label on an Honeywell printer, you need to:

1. Create a label format.
2. Send the format to the printer.
3. Send data to fill in the fields in the format.
4. Print the label.

A format is a template that defines how the information prints on a label. You define a format by sending IPL command strings to the printer. The printer stores the format in its RAM or flash module. You can edit formats with IPL commands if you place the printer in Program mode.

See Also:

Create a Sample Label Format

Complex Label Design Examples

About Field Types

A barcode label format is composed of several different fields that hold different types of data. The fields may differ in size, location, and orientation, as well as data type. You define information to be printed on the label as a field in the format. After the fields are defined, you can pass data to the fields and print the label.

These are the IPL field types:

Human-Readable fields

Barcode fields

Line and Box fields

User-Defined Character (UDC) or Graphics fields

This illustration shows a typical barcode label and how the different field types are used.

Human-Readable Fields

Human-readable fields contain information or data that is printed in one of the printer's internal fonts or in a user-defined font. The available fonts depend on your printer. These internal fonts are on your printer:

- Standard bitmap fonts measured in dots
- Bitmap fonts recognized by optical character recognition (OCR) applications
- Bitmap fonts measured in point sizes
- Bitmap monospaced fonts
- Outline fonts

Font character size can be changed by using the width and height magnification commands, or with the pitch and point-size commands. The fonts themselves remain unchanged.

Honeywell printers support different international character sets for each command set mode and may also contain character sets and code pages.

See Also

Printer Language, Select

ASCII Tables and International Character Sets

Barcode Fields

Barcode fields include data and information to be printed in a specific barcode symbology. Barcode fields can be accompanied by an interpretive field, which shows the barcode data in readable characters.

You can use IPL commands to modify barcode fields.

Line and Box Fields

You can use lines or boxes in a label format to separate fields and create borders on the label. Use IPL commands to define the location and size of line and box fields in a label format.

User-Defined Character (UDC) or Graphics Fields

These fields contain graphics or bitmap characters. You can create the graphic in a command string using the Graphic or UDC, Define command.

The maximum size of a user-defined graphic is limited by the capacity of your printer.

You can use Direct Graphics mode to reduce the time it takes to download and print an image.

See Also

About Direct Graphics Mode

How to Work with Fonts and Graphics

How to Work with Fields

In addition to understanding the different types of printable fields on the printer, you need to know how to arrange them to define or change the format of a label.

You can use IPL commands to make these changes:

[Edit Field Zero (H0)](#)

[Number Fields in a Format](#)

[Edit Existing Fields](#)

[Delete Fields](#)

[Position Fields](#)

[Rotate Fields](#)

[Scale Fields](#)

See Also [About Interpretive Fields and Field Location](#)

About Interpretive Fields and Field Locations

Each barcode field can have an interpretive field associated with it. For example, barcode field B33 would have an interpretive field I33.

Each interpretive field uses a field location from the available 400 fields. To avoid interference with other user-defined fields, interpretive fields are automatically assigned numbers beginning with the highest available field number. For example, if B33 is the first barcode field with interpretive text, its interpretive field (I33) is assigned location 399. You can see how the printer uses the fields internally by uploading the format and examining where the interpretives appear. If you need to use more fields than IPL can accommodate in a single format (because of interpretive fields), you can use pages to combine several formats on one label.

Edit Field Zero (H0)

By default, the printer automatically creates a human-readable field numbered zero (H0) each time you create a format using the [Format, Create or Edit command](#). H0 is created with the default parameters in the next table.

Default Parameters

Command	Definition
o0,0;	Field origin is 0,0.
f0;	Field direction is horizontal with respect to the label motion from printer.
h2;	Field height magnification is 2.
w2;	Field width magnification is 2.
c0;	Selects the 7x9 standard font.
b0;	Selects no border around human-readable field.
r0;	Selects horizontal orientation of characters.
d0,30;	You enter variable data in Print mode. The maximum number of characters you can enter into this field is 30.

This automatically created field is always a human-readable field and is always assigned field number 0. Because a format must always have at least one defined field, you cannot delete field 0 if it is the only field in the format.

To change field 0 to a different type of field (for example, a barcode field)

1. Create a temporary field of any type.
2. Delete field 0.
3. Create field 0 with a different type.
4. Delete the temporary field.

Example

<STX><ESC>P;E1;F1;L39;D0;B0;D39;<ETX>

where:

<ESC>P;	Enters Program mode.
E1;	Erases format 1.
F1;	Creates format 1.
L39;	Creates line field (temporary field).

D0;	Deletes field 0.
B0;	Creates barcode field 0.
D39;	Deletes the temporary line field.

How to Number Fields in a Format

Be sure you assign a different field number to each field in a format. A format can have up to 400 fields, numbered 0 to 399.

Keep in mind that you enter data into fields according to their numeric value if you use a <CR> to separate the data. In other words, the first string of data you enter goes into the lowest numbered field, the second string of data you enter goes into the next lowest numbered field, and so on.

Edit Existing Fields

You can change a specific field in a format by sending a command in Program mode. You can modify just the incorrect format fields instead of having to download the entire format again.

When the printer is in Program mode, it uses a field pointer to point to the field to be modified. The pointer continues to point to the most recently selected field until you select a different format or field.

Example

Assume that you use this format:

Command	Description
<STX><ESC>C<ETX>	Selects Advanced mode.
<STX><ESC>P<ETX>	Enters Program mode.
<STX>E3;F3;<ETX>	Erases format 3, Creates format 3.
<STX>H0;o80,100;f0;c0;d0,16;h1;w1;<ETX>	Creates field H0.
<STX>H1;o80,120;f0;c0;d0,16;h1;w1;<ETX>	Creates field H1.
<STX>H2;o80,150;f0;c2;d0,14;h1;w1;<ETX>	Creates field H2.
<STX>H3;o80,190;f0;c2;d0,16;h1;w1;<ETX>	Creates field H3.
<STX>B3;o80,0;f0;c0,1;h50;w1;d0,11;i0;p@;<ETX>	Creates field B3.
<STX>R;<ETX>	Saves and exits to Print mode.

To change the height and width of field 3 to 2 dots, download this command string:

<STX><ESC>P;F3;H3;h2;w2;R;<ETX>

where:

<ESC>P;	Enters Program mode.
F3;	Accesses format number 3 from memory.
H3;	Accesses field 3.
h2;	Sets the height to 2 dots.
w2;	Sets the width to 2 dots.
R;	Returns to Print mode.

Delete Fields

You can delete any field from a format unless the format only has one field.

Example

This command string deletes field 3 from format 4:

<STX><ESC>P;F4;D3;R<ETX>

where:

<ESC>P	Enters Program mode.
F4	Accesses format 4.
D3	Deletes field 3.
R	Returns to Print mode.

How to Position Fields

You cannot tell exactly how the field looks until it prints, so you may need to make several test prints before you get the field positioned correctly.

For all types of fields, determine the print position by defining the coordinates of the upper left corner of the unrotated field.

The field origin is the upper left corner of an unrotated field. To define the coordinates of the field origin, use the Field Origin, Define command (*ox,y*), where:

o	is the command syntax.
x	is the distance (in dots) from the left edge of the label to the field origin.
y	is the distance (in dots) from the top edge of the label to the field origin.

The actual measurements for *x* and *y* depend on the size of the printhead in your printer. This table lists printhead sizes and the corresponding number of dots per mm.

Printhead Size	Dots/mm
203 dpi	8
300 dpi	11.8
406 dpi	16

For example, to position a field to print approximately 0.25 inch from the left side and 0.5 inch from the top of your label, the Field Origin, Define command value is o51,102.

A = o51, 102   C = o51, 305
B = o51, 203   D = o355, 102
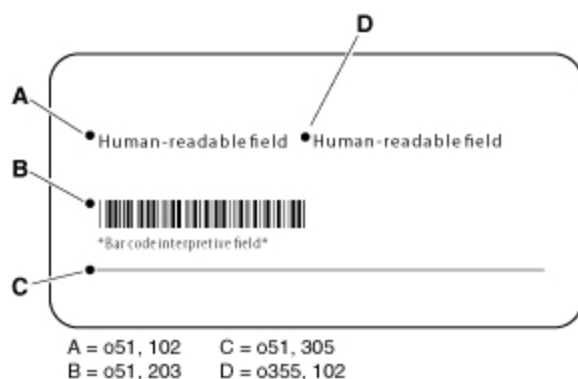
Rotate Fields

You can rotate any type of printable field in increments of 90 degrees counterclockwise around the field origin. To position a rotated field, remember that the field origin remains on the corner where it was before you rotated the field. If you rotate a field 90 degrees counterclockwise, the origin that was at the upper left corner is now at the lower left corner. Use the [Field Direction, Define command](#) (syntax f*n*) to define the field rotation.

- To rotate a field 90 degrees, you must position the lower left corner of the rotated field.

- To rotate a field 180 degrees, you must position the lower right corner of the rotated field.

- To rotate a field 270 degrees, you must position the upper right corner of the rotated field.
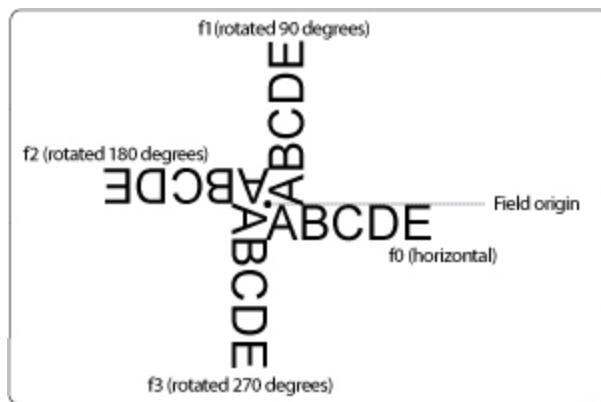
Scale Fields

The size of a field is determined by the font or graphic you use and the field magnification factors you apply. You can use the height and width magnification commands to scale each of these fields even further.

Magnify Fonts and Character Fields

Internal printer fonts already have specific sizes. For example, the letters in font c0 are 7 dots wide by 9 dots high, with a 1-dot gap between characters. If you design a field that prints 10 letters in font c0, the field will be 79 dots wide by 9 dots high.

By applying magnification factors (h for height and w for width), you can increase a field's height or width. If you increase the height to 2 (h2) for the field described above, the field height doubles, and the final field prints 79 dots long by 18 dots high. If you change the height magnification to h3, the field height triples, and the field prints 79 dots by 27 dots.

Increasing the width of a text field to 2 makes each letter in the field twice as wide.

When you magnify a bitmap font, the edges of the characters become jagged. If you want to print large text characters, use an outline font.

Examples

The default human-readable field H0 prints the 7 x 9 font. Enter this text as data:

EXAMPLE

When you apply a magnification factor of 3 to human-readable field H0, the font now prints the image below:

EXAMPLE

Magnify Barcode Fields

You can also use height and width commands to modify barcode fields, but the commands are defined differently for use with barcodes.

For barcode fields, the height magnification is the actual dot height of the barcode. If you set a height magnification of 20, the height of the barcode field will be 20 dots.

Printing narrow barcodes conserves space on each label as well as media; however, if you plan to scan barcodes from a distance, you may need to magnify the barcode widths.

The width magnification factor for barcode fields refers to the width of the narrowest element of the barcode. When you specify a narrow element width of 3, the width of the narrowest element in the symbology is 3 dots wide. The spaces and large element widths are magnified according to preset ratios for each symbology.

You can only print a bar width of 1 if you are printing in drag mode (bars perpendicular to the print head). If you select a width of 1 in picket mode (bars parallel to the print head), the printer defaults to 2.

The default height for barcode fields is 50 dots, and the default width for narrow elements is 1 dot.

If you are using the POSTNET symbology, follow the rules for magnifying fonts.

Specify Data for Fields

After you design a format for a barcode label, you need to provide the data to be printed in human-readable or barcode fields.

For human-readable fields, you can specify data in two ways:

- Add the data to the command string that defines that field. This is a good choice for text that is constant from label to label.

- Add command strings after the label format that include the data to be printed. This is a good choice for text that may change from label to label, such as incremental numbering. You need to place the printer into Print mode before adding these command strings.

For barcode data, place the printer in Print mode, and then add command strings that include the data to be printed.

These examples demonstrate how to specify data for fields:

- [Constant Data Example](#)
- [Changing Data Example](#)
- [Next Data Entry Field, Select Command Example](#)

How to Work with RFID Tags

If a printer has an RFID module installed, the RFID mode is automatically turned on. You need to configure the printer, declare a format that includes commands to read and write to the tag, and print the format to a label. The printer aligns the tag with the antenna, executes the RFID commands, repositions the label, prints the image buffer to the label, and then positions the next label for printing.

How to Write Data to an RFID Tag

To write data to an RFID tag you need to specify an area in the tag's memory, and define the data that will be written to the tag.

To specify an area in the tag's memory, you define an RFID tag write field. This field specifies:

- which segment is written to.
- the start position.
- the length of data (in bytes).
- the format of the data.

How Data Is Stored on an RFID Tag

Data written to the RFID tag is stored from the left starting with the byte that is defined as the start of field byte and going the length of the defined field (in bytes).

Write Hex or ASCII Formats

If the tag format is hex or ASCII and the field source data string is shorter than the allocated number of bytes, the data string's least significant bytes (from the right) are padded with zeroes until they fill the length of the field.

If the field source data string is longer than the allocated number of bytes, the error <EOT> is sent and nothing is written to the tag. If auto-transmit level 3 is enabled, an <EOT> status response is returned to the host.

Write Numerical Formats

If the tag format is numerical (NUM), the data is stored as a numerical value. In this tag format, if the field source data string is shorter than the allocated number of bytes, the data string's most significant bytes (from the left) are padded with zeroes until they fill the length of the field.

The number of bytes needed to represent a numerical value is never greater than the number of bytes needed to represent the number as a data string.

Create a Sample Label Format

In this example, you will design a simple label that includes a human-readable field, a line field, and a barcode field.

On a blank label, sketch a format that looks roughly like the sample. Use a human-readable field and a barcode field, and separate them with a line field.

Position Fields in a Label Format

Each field in a label format is positioned relative to the label origin, which is the top left corner of the label. To set the origin of a field on a label, you assign x and y coordinates to the upper left corner of the field, where x is the distance (in dots) from the left edge of the label, and y is the distance (in dots) from the top edge of the label.
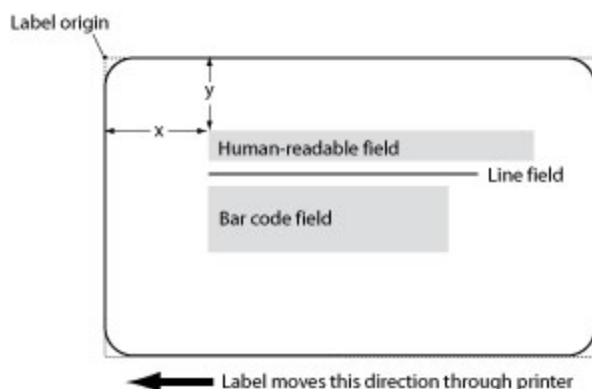
To determine the field origin

1. Measure the distance (in mm) from the upper left corner of the human-readable field to the left edge of the label.

2. To determine the value for x, multiply the distance times the number of dots per mm for your printhead.

Printhead Size	Dots/mm
203 dpi	8
300 dpi	11.8
406 dpi	16

For example, if you are designing the label for a printer with a 203 dpi printhead and the distance is 25 mm: 25 mm x 8 dots/mm = 200. The value for x is 200.

3. Measure the distance (in mm) from the top left corner of the human-readable field to the top edge of the label.

4. To determine the value for y, multiply the distance times the number of dots for your printhead.
   For example, if the distance is 12.5 mm: 12.5 mm x 8 dots/mm = 100. The value for y is 100. The origin position for the human-readable field is 200, 100.

5. Repeat steps 1-4 to find the origin points for the line field and for the barcode field.

Create Command Strings for the Label Formats

Next, write the IPL command strings to create the label format.

You use IPL commands to create and define each field in the format. For example, to create a human-readable field, you use the Human-Readable Field, Create or Edit command.

Each type of field is defined by several parameters. For example, a human-readable field includes settings for field origin point, font, direction, height and width, data source, and number of characters.

To create the command strings

1. Open a text editor or word processor application.

2. Type these three command strings to select Advanced mode, place the printer in Program mode, and create and define the label format:

   <STX><ESC>C<ETX>
   <STX><ESC>P<ETX>
   <STX>E4;F4<ETX>

   where:

<STX>	is the ASCII start of text control code in readable characters. Each command string must begin with the start of text control code or its equivalent in readable characters.
<ESC>C	is the syntax for the Advanced Mode, Select command.

<ETX>	is the ASCII end of text control code in readable characters. Each command string must end with the end of text control code or its equivalent in readable characters.
<ESC>P	is the syntax for the Program Mode, Enter command. You need to place the printer in Program Mode to create and define a label format.
E4	is the syntax for the Format, Erase command (E) and indicates that the command clears format 4 from the printer memory.
F4	is the syntax for the Format, Create or Edit command (F) and indicates that the command creates a new, blank format 4 in the printer memory.

The lowercase letter "l" and the number "1" look very similar. Make sure to note the difference so that you enter the command correctly.

3. Type this string to create and define the human-readable field:

<STX>H0,o200,100;c25;f0;h20;w20;d0,30<ETX

where:

H0	H is the syntax for the Human-Readable Field, Create or Edit command with field number 0.
o200,100	sets the origin point for the field, where x = 200 and y = 100.
;	is the command terminator character used to separate each command and its associated data from the next command.
c25	selects the font to use in this field and 25 = outline font.
f0	sets the field direction and 0 = horizontal.
h20	sets the height magnification to 20.
w20	sets the width magnification value to 20.
d0,30	sets the data source and length, which is data field 0 with a maximum length of 30 characters.

4. Press **Enter**.

5. Type this string to create and define the line field:

<STX>L1;o200,200;f0;l575;w5;<ETX>

where:

L1	is the syntax for the Line Field, Create or Edit command, with field number 1.
o200,100	sets the origin of the line field, where x = 200 and y = 200.
;	is the command terminator character.

f0	sets the field direction and 0 = horizontal.
l575	sets the length of the line in dots to 575.
w5	sets the width of the line in dots to 5.
d0,30	sets the data source and length, which is data field 0 with a maximum length of 30 characters.

6. Press **Enter**.

7. Type this string to create and define the barcode field:

<STX>B2;o200,150;c0,0;h100;w2;i1;d0,10;<ETX>

where:

B2	is the syntax for the Barcode Field, Create or Edit command with field number 2.
o200,150	sets the origin of the barcode field, where x = 200 and y = 150.
;	is the command terminator character.
c0, 0	is the syntax for the Barcode, Select Type command, where 0,0 specifies Code 39, 8646 compatible, with no check digit.
h100	is the syntax for the Hardware Configuration Label, Print command, where 100 indicates a magnification of 100 dots tall.
w2	is the syntax for Width of Line, Box, Bar, or Character, Define command, where 2 indicates a magnification of 2 dots wide.
i1	is the syntax for the Interpretive Field, Enable or Disable command, where 1 enables the field.
d0,10	is the syntax for the Field Data, Define Source command, where 0,10 indicates that the data is entered in Print mode and has a maximum length of 10 characters.

8. Press **Enter**.

9. Type this string to define the interpretive field:

<STX>I2;h1;w1;c20<ETX>

where:

I2	is the syntax for the Interpretive Field, Edit command, with field number 2 (matches the accompanying barcode field number).
h1	is the syntax for the Height Magnification of Bar, Box, or UDC, Define command, with a magnification level of 1 dot vertically.

w1	is the syntax for the Width of Line, Box, Bar, or Character, Define command, with a magnification level of 1 dot horizontally.
c20	is the syntax for the Font Type, Select command, where 20 specifies the 8-point monospace font.

10. Press **Enter**.

11. Type this string to place the printer in Print mode, access format 4, and clear previous field data:

    <STX>R<ETX>
    <STX><ESC>E4<ETX>
    <STX><CAN><ETX>

    where:

R	places the printer in Print mode.
<ESC>E4	is the syntax for the Format, Select command and selects format 4.
<CAN>	is the syntax for the Clear All Data command.

12. Press **Enter**.

13. Type this string to create the data lines for the human-readable and barcode fields:

    <STX>THIS IS THE SAMPLE LABEL<CR><ETX>
    <STX>SAMPLE<ETX>

    where:

THIS IS THE SAMPLE LABEL	is the data line for the human-readable field. The fields in the label format are populated in order by field number.
<CR>	is the syntax for the Next Data Entry Field, Select command.
SAMPLE	is the data line for the barcode interpretive field.

14. Press **Enter**.

15. Type this string:

    <STX><ETB><ETX>

    where

    <ETB> is the syntax for the Print command.

    The lowercase letter "l" and the number "1" look very similar. Make sure to note the difference so that you enter the command correctly.

16. Save the text file as "SampleLabel.txt". The label format command strings are complete and look like this:

```
<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E4;F4<ETX>
<STX>H0;o200,100;f0;c25;h20;w20;d0,30<ETX>
<STX>L1;o200,150;f0;l575;w5<ETX>
<STX>B2;o200,200;c0,0;h100;w2;i1;d0,10<ETX>
<STX>I2;h1;w1;c20<ETX>
<STX>R<ETX>
<STX><ESC>E4<ETX>
<STX><CAN><ETX>
<STX>THIS IS THE SAMPLE LABEL<CR><ETX>
<STX>SAMPLE<ETX>
<STX><ETB><ETX>
```

Print the Sample Label

To print the sample label, you can open a communications program (such as HyperTerminal) and send the text file to the printer. For more information on connecting to the printer, see your printer user's manual. The label looks like this when printed:

Complex Label Design Examples

Use these examples of complex barcode label designs to help give you ideas for your own label formats:

- [Lines and Boxes Example](#)
- [Graphics and Rotated Fields Example](#)
- [RFID Tag Example](#)

About Asian Fonts

IPL supports these downloadable TrueType Asian fonts:

Font ID	Font Name	Mapped to Monotype TrueType Fonts
50	Kanji outline font	TBMinPro-Light
51	Kanji monospace outline font	TBMinPro-Light
52	Katakana 12 x 16 bitmap	TBMinPro-Light
53	Katakana 16 x 24 bitmap	TBMinPro-Light
54	Katakana 24 x 36 bitmap	TBMinPro-Light
55	Kanji 16 x 16 bitmap	TBMinPro-Light
56	Kanji 24 x 24 bitmap	TBMinPro-Light
57	Kanji	TBMinPro-Light
58	Korean	HYGoThic-Medium
59	Traditional Chinese	MSung HK Medium
60	Simplified Chinese	MSungPRC Medium

You can download these fonts the same way that you download other fonts. Before you send Asian fonts to the printer, you need to refer to the font with its ID and save the script file with encoding as UTF-8.

To download additional Asian fonts, use the font aliasing feature.

Changing Data Example

This example shows how to define a simple barcode label format that prints a part number in a barcode field and an incremented order number in a human-readable field. The order number changes for every label printed in this format. You use the Numeric Field Separator command (syntax <FS>) to specify the numeric data to be incremented, and the Field Increment, Set command (syntax <ESC>I) to specify the increment value.

Command String	Definition
<STX><ESC>P;E2;F2<ETX>	Places the printer in Program mode, erases current format 2, and creates a new format 2.
<STX>H0;o200,50;d3,ORDER NUMBER FORMAT<ETX>	Changes the default settings for field 0, placing the origin at 200,50, and specifying the text "ORDER NUMBER FORMAT" for the field data.
<STX>B1;o200,100;i1;d0,13<ETX>	Defines a barcode field at origin 200,200, enables an interpretive field, specifies that data for this field will be transmitted when the printer is in Print mode, and sets a data length of 13 characters. All other field settings are defaults.
<STX>H2;o200,350;d3,ORDER NUMBER<ETX>	Defines a human-readable field at origin 200,350, and specifies the text "ORDER NUMBER" for the field data. All other field settings are defaults.
<STX>H3;o200,400;d0,30<ETX>	Defines a human-readable field at origin 200,400, and specifies that data for this field will be transmitted when the printer is in Print mode. All other field settings are defaults.
<STX>R<ESC>E2<CAN><ETX>	Places the printer in Print mode, selects format 2, and clears all previous data.
<STX><ESC>F1<LF>*999-999-999*<ETX>	Selects field 1 (the barcode field) and specifies the data to be printed in that field (*999-999-999*).

Command String	Definition
<STX><ESC>F3<FS>1000<FS><ESC>I5<ETX>	Selects field 3 and specifies the value "1000" for the field data. <FS> is the syntax for the Numeric Field Separator command, and indicates that the value is to be incremented for each label. <ESC>I is the syntax for the Field Increment, Set command, and sets an incrementation value of 5.
<STX><RS>3<ETB><ETX> <RS>	<RS> is the syntax for the Quantity Count, Set command, and specifies that 3 labels are to be printed. <ETB> prints the labels. The order numbers on these labels should be 1000, 1005, and 1010.

Constant Data Example

This example defines a simple barcode label format that prints a part number in a barcode field with an interpretive field. The data (part number) remains constant for all labels printed using this format.

Command String	Definition
<STX><ESC>P<ETX>	Places the printer in Program mode.
<STX>E2;F2<ETX>	Erases current format 2 and creates new format 2.
<STX>H0;o200,50;d3,PART NUMBER FORMAT<ETX>	Changes the default settings for field 0: places the origin at 200,50, and specifies the text "PART NUMBER FORMAT" for the field data.
<STX>B1;o200,200;i1;d0,13<ETX>	Defines a new barcode field at origin 200,200, enables an interpretive field, specifies that data for this field will be transmitted when the printer is in Print mode, and sets a data length of 13 characters. All other field settings are default values.
<STX>R<ETX>	Places the printer in Print mode.
<STX><ESC>E2<CAN><ETX>	Selects format 2 and clears all previous data.
<STX><ESC>F1<LF>*999-999-999*<ETX>	Selects field 1 (the new barcode field) and specifies the data to be printed in that field (*999-999-999*).
<STX><ETB><ETX>	Prints the barcode label.

Font Aliasing Example

This example illustrates how to [replace an existing font using font aliasing](#).

To modify the font alias file and remap the default font:

1. Start your printer running IPL. The printer creates a blank template of the alias file (iplfnt.als):

   <ID><FNTNAME><SYSFONT><POINT><HEIGHT><WIDTH><X-OFFSET><Y-OFFSET>

2. Print this IPL label:

   <STX><ESC>C<ETX>
   <STX><ESC>P<ETX>
   <STX>E*;F*<ETX>
   <STX>H0;o250,31;d3,Hello Joe<ETX>
   <STX>R<ETX>
   <STX><ESC>E*<ETX>
   <STX><CAN><ETX>
   <STX><ETB><ETX>

   This label prints:

   Hello Joe
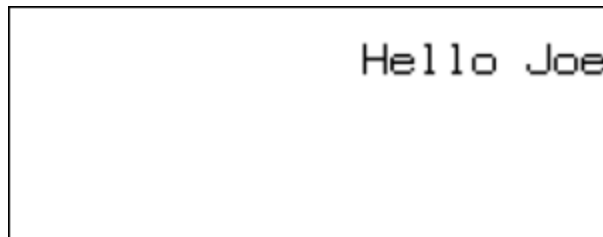
3. Copy the iplfnt.als file from the printer font directory (/home/user/fonts) to your PC.

4. Edit the alias file:

   <ID>0<FNTNAME>font1<SYSFONT>CG
   Times<POINT>14<HEIGHT>100<WIDTH>100<X-OFFSET>0<Y-OFFSET>0

5. Copy the modified iplfnt.als file from your PC to the printer font directory.

6. Send the data stream to print the IPL label. This label prints:

   Hello Joe

See Also

[Replacing an Existing Font Using Font Aliasing](#)

HOW TO WORK WITH FONTS AND GRAPHICS

The printers come with several TrueType® fonts and some bitmap fonts installed. Although both bitmap and TrueType fonts are supported, Honeywell recommends using TrueType fonts. You can also download OpenType® fonts based on TrueType fonts to the printer.

You can:

- download fonts to the printer.

- install Asian fonts.

- transfer graphics with the printer web page, USB storage device, or FTP.

- create user-defined characters and fonts.

- replace an existing font using font aliasing.

Download Fonts to the Printer

You can download fonts to the printer and store them in the non-volatile memory. Although the printer reserves 16 font ID numbers (3 to 6, and 8 to 19) for downloaded fonts, the amount of available memory limits the number of fonts you can store.

There are four ways to download fonts to the printer:

- Use the PrintSet 5 application.
- Use the web page.
- Use a USB mass storage device.
- (Advanced users only) Use IPL commands.

Use PrintSet 5 to Download Fonts

The easiest way to download fonts to the printer is with the PrintSet 5 application. However, PrintSet 5 does not convert font formats. Fonts must be in the appropriate format before you download them to the printer.

For more information about PrintSet 5, see the PrintSet 5 online documentation that ships with the application. You can download the latest release of PrintSet 5 from the Honeywell website.

Use the Web Page to Download Fonts

You can use the printer web page to download fonts. For more information on using the printer web page to download fonts, see your printer user manual.

Use a USB Storage Device to Download Fonts

You can use a USB storage device to install fonts on the printer, but you need to make sure your fonts are located in the right directory on the storage device. For the printer to be able to find your fonts, they need to be placed in the /fonts directory on the USB storage device. For more information on using a USB storage device to download fonts, see your printer user manual.

Use IPL Commands to Download Fonts

Although the easiest way to download fonts is with PrintSet 5, you can also use the IPL command set to create and download user-defined bitmap fonts to your Honeywell printer. A user-defined font (UDF) is a custom font you can design yourself. You can use user-defined fonts in human-readable fields or in the interpretive field that accompanies a barcode field.

To learn more about bitmap font formats, see Create User-Defined Font Characters for Advanced Mode.

How to Install Asian Fonts

The printers support downloadable TrueType Asian fonts. You can download the TrueType Asian fonts in the same way that you download other fonts. For more information, see Download Fonts to the Printer.

Font IDs c50 to c60 are reserved for downloadable Asian fonts. Before you send Asian fonts to the printer, you need to refer to the font with its ID and save the script file with encoding as UTF-8.

How to Create User-Defined Characters and Fonts

You can create user-defined characters and user-defined fonts for use in barcode labels.

A user-defined character (UDC) is a custom graphic you can use in graphic fields.

A user-defined font (UDF) is a custom font you design. UDFs can be used in human-readable fields or in the interpretive field that accompanies a barcode field.

UDCs and UDFs are created in a six bits per byte format for printers in Advanced mode, or in a one bit per byte format for printers in Emulation mode.

You use a variety of IPL commands to create and define user-defined characters and fonts. After you write the command strings that create UDCs and UDFs, you download the command strings to the printer and save them to the printer memory.

See Also

Create User-Defined Characters for Advanced Mode

Create User-Defined Font Characters for Advanced Mode

User-Defined Character (UDC) or Graphics Fields

Create User-Defined Characters for Advanced Mode

If your Honeywell printer is running in Advanced mode (dot size of 2.5 or 5 mil), UDCs must be downloaded to the printer in the six bits per byte format.

The six bits per byte format is more compact than one bit per byte. When you use six bits per byte, you can download large graphics more quickly. The difference between 2.5 mil and 5.0 mil modes is the size of the image when it prints.

The arrangement of the bits is very important in this format. Eight bits (0 through 7) compose every byte, but the printer only uses bits 0 through 5 to map the image.

You must always set bit 6 (the seventh bit) to 1 so you can download data to the printer. 7-bit hosts reserve bit 7 (the eighth bit) for parity and compatibility, so the range of characters for any given UDC is 40 hex (@) to 127 hex (■ delete character).

This procedure describes how to create a user-defined character in the six bits per byte format for use in Advanced mode.

1. Draw the graphic on graph paper. This procedure uses this graphic as an example:
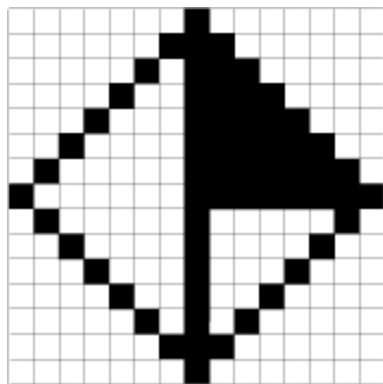
2. Convert each of the squares to either a one or a zero, where the blank boxes are zeros and the filled-in boxes are ones. Type these into a text file column by column, as shown here:

```
000000010000000
000000111000000
000001011100000
000010011110000
000100011111000
001000011111100
010000011111110
100000011111111
010000010000010
001000010000100
000100010001000
000010010010000
000001010100000
000000111000000
000000010000000
```

3. Starting from the top row, divide each vertical column into groups of six digits. If the bottom group has less than six digits, add zeros to this group until it also has six.

```
00000010000000
000000111000000
000001011100000
000010011110000
000100011111000
001000011111100
010000011111110
100000011111111
010000010000010
001000010000100
000100010001000
000010010010000
000001010100000
000000111000000
000000010000000
000000000000000
000000000000000    Zeros added
000000000000000
```

The six digits in each group are the six bits that you download in a byte of data. The top digit of each group is bit 0, the bottom digit is bit 5.

4. To complete the bit, add ones in the bit 6 position, and then add zeros in the bit 7 position so that each group now has eight digits.

```
         000000010000000  Bit 0
         000000111000000  1
         000001011100000  2
Group 1  000010011110000  3
         000100011111000  4
         001000011111100  5
         111111111111111  6
         000000000000000  7
         010000011111110  Bit 0
         100000011111111  1
         010000010000010  2
Group 2  001000010000100  3
         000100010001000  4
         000010010010000  5
         111111111111111  6
         000000000000000  7
         000001010100000  Bit 0
         000000111000000  1
         000000010000000  2
Group 3  000000000000000  3
         000000000000000  4
         000000000000000  5
         111111111111111  6
         000000000000000  7
```

5. Starting with the first group of 8 bits in the first column, reverse the order of each group so that bit 0 is now last and bit 7 is first. One way to see this quickly is to imagine rotating each group 90º clockwise, as shown in this illustration:

Group 1	Group 2	Group 3
01000000	01000010	01000000
01000000	01000101	01000000
01100000	01001000	01000000
01010000	01010000	01000000
01001000	01100000	01000000
01000100	01000000	01000001
01000010	01000000	01000010
01111111	01111111	01000111
01111110	01000011	01000010
01111100	01000011	01000001
01111000	01100011	01000000
01110000	01010011	01000000
01100000	01001011	01000000
01000000	01000111	01000000
01000000	01000010	01000000

Bit 7   Bit 0   Bit 7   Bit 0   Bit 7   Bit 0

Reading from left to right, each line is now made up of three eight–digit groups.

6. Translate each line into a string of three ASCII characters. For a list of ASCII characters and binary equivalents, see the [Full ASCII Table](). For example, reading from left to right, the first line is:

01000000 0100001001000000

The equivalent ASCII characters are @B@. The entire format should look like this:

@B@
@E@
`H@
PP@
H`@
D@A
B@B
<DEL><DEL>G
~CB
|CA
xc@
pS@
`K@
@G@
@B@

7. In a new text file, write command strings to place the printer in Advanced mode, and then in Program mode:

<STX><ESC>C<ETX>
<STX><ESC>P<ETX>

8. Write a command string to create a user-defined character, and define its size as 15 x 15 dots:

<STX>G1;x15;y15<ETX>

9. Add command strings for the graphic format you created in step 6. Place the ASCII start of text character at the beginning of each line, followed by the Graphic or UDC, Define command syntax (u). Number each line from 0 to 14, and then add the ASCII end of text character to the end of the line:

<STX>u0,@B@<ETX>
<STX>u1,@E@<ETX>
<STX>u2,`H@<ETX>
<STX>u3,PP@<ETX>
<STX>u4,H`@<ETX>
<STX>u5,D@A<ETX>
<STX>u6,B@B<ETX>
<STX>u7,<DEL><DEL>G<ETX>
<STX>u8,~CB<ETX>
<STX>u9,|CA<ETX>
<STX>u10,xc@<ETX>
<STX>u11,pS@<ETX>
<STX>u12,`K@<ETX>
<STX>u13,@G@<ETX>
<STX>u14,@B@<ETX>

10. Write a command string to place the printer in Print mode:

<STX>R<ETX>

11. Save the text file and send it to the printer. The graphic can now be used in a label format.

12. To print the graphic, send this set of command strings:

<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E4;F4<ETX>
<STX>U1;o100,100;c2;w20;h20;<ETX>
<STX>R;<ETX>
<STX><ESC>E4<ETX>
<STX><ETB><ETX>

This graphic prints:

This table lists the complete command string set for the UDC example.

Command	Definition
<STX><ESC>C<ETX>	Places the printer in Advanced mode.
<STX><ESC>P<ETX>	Places the printer in Program mode.
<STX>G1;x15;y15<ETX>	Creates UDC 1, 15 rows by 15 columns.
<STX>u0,@B@<ETX>	Defines column 0.
<STX>u1,@E@<ETX>	Defines column 1.
<STX>u2,`H@<ETX>	Defines column 2.
<STX>u3,PP@<ETX>	Defines column 3.
<STX>u4,H`@<ETX>	Defines column 4.
<STX>u5,D@A<ETX>	Defines column 5.
<STX>u6,B@B<ETX>	Defines column 6.
<STX>u7,<DEL><DEL>G<ETX>	Defines column 7.
<STX>u8,~CB<ETX>	Defines column 8.
<STX>u9,|CA<ETX>	Defines column 9.
<STX>u10,xc@<ETX>	Defines column 10.
<STX>u11,pS@<ETX>	Defines column 11.
<STX>u12,`K@<ETX>	Defines column 12.
<STX>u13,@G@<ETX>	Defines column 13.
<STX>u14,@B@<ETX>	Defines column 14.
<STX>R<ETX>	Saves and exits to Print mode.
<STX><ESC>C<ETX>	Places the printer in Advanced mode.
<STX><ESC>P<ETX>	Places the printer in Program mode.
<STX>E4;F4<ETX>	Erases current format 4 and creates new format 4.
<STX>U1;o100,100;c2;w20;h20<ETX>	Creates graphic field 1, origin of 100,100, uses graphic 1, and magnifies it by a factor of 20.
<STX>R<ETX>	Saves and exits to Print mode.
<STX><ESC>E4<ETX>	Selects format 4.
<STX><ETB><ETX>	Prints the format.

Create User-Defined Font Characters for Advanced Mode

Creating user-defined font characters for Advanced mode is almost identical to the procedure for creating user-defined characters. You need to define the format for each ASCII character you want to use. For help, see Creating User-Defined Characters for Advanced Mode.

Additionally, when you write the command strings that define the ASCII characters for the font, you need to include syntax for these commands:

- Bitmap User-Defined Font, Clear or Define command: This command creates a new font and font number. Syntax is Tn, where n is the font number.

- Bitmap Cell Width for Graphic or UDF, Define command: This command defines the width for all cells that contain a character from this font. Syntax is xn, where n is the cell width in dots.

- Bitmap Cell Height for Graphic or UDF, Define command: This command defines the height for all cells that contain a character from this font. Syntax is yn, where n is the cell height in dots.

- User-Defined Font Character, Create command: This command creates the new character. Syntax is tn, where n is the decimal equivalent of the corresponding ASCII character. For help, see the Full ASCII Table. You need to add this syntax for each new character in your user-defined font.

- Intercharacter Space for UDF, Define command: This command defines the amount of space added to the default intercharacter gap length for a bitmap font. Syntax is zn, where n is the number of dots to add to the default spacing of 2.

1. Draw the graphic on graph paper. This procedure uses this graphic as an example:
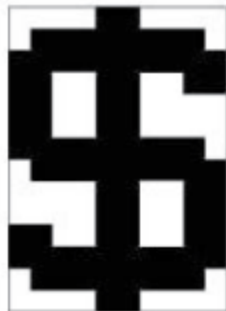
2. Convert each of the squares to either a one or a zero, where the blank boxes are zeros and the filled-in boxes are ones.

3. Starting from the top row, divide each vertical column into groups of six digits. If the bottom group has less than six digits, add zeros to this group until it also has six.

   The six digits in each group are the six bits that you download in a byte of data. The top digit of each group is bit 0, the bottom digit is bit 5.

4. To complete the bit, add ones in the bit 6 position, and then add zeros in the bit 7 position so that each group now has eight digits.

5. Starting with the first group of 8 bits in the first column, reverse the order of each group so that bit 0 is now last and bit 7 is first. One way to see this quickly is to imagine rotating each group 90° clockwise.

   Reading from left to right, each line is now made up of three eight-digit groups, and each group represents an ASCII character in binary form.

6. Translate each line into a string of three ASCII characters. For a list of ASCII characters and binary equivalents, see the [Full ASCII Table](#).

   <STX><ESC>C<ETX>
   <STX><ESC>P<ETX>

7. Write a command string to create a user-defined font:

   <STX>T3,FONT3<ETX>

8. Write a command string that defines the width and height for cells that contain characters in this font. For this example, the width and height are defined as 10 and 14 dots respectively:

   <STX>x10;y14<ETX>

9. Write a command string that creates the specific ASCII character and defines the width of that character. For this example, the user-defined graphic corresponds to the $ symbol (ASCII character 36) and has a width of 12 dots:

   <STX>t36;z12<ETX>

10. Add command strings for the character format you created earlier. Place the ASCII start of text character at the beginning of each line, followed by the [Graphic or UDC, Define command](#) syntax (u). Number each line from 0 to 14, and then add the ASCII end of text character to the end of the line:

    <STX>u0,|q@;<ETX>
    <STX>u1,~sA;<ETX>
    <STX>u2,FcA;<ETX>
    <STX>u3,FcA;<ETX>
    <STX>u4,<DEL><DEL>C;<ETX>
    <STX>u5,<DEL><DEL>C;<ETX>
    <STX>u6,FcA;<ETX>
    <STX>u7,FcA;<ETX>
    <STX>u8,N<DEL>A;<ETX>
    <STX>u9,L~@;<ETX>

11. Repeat steps 4 and 5 for each character in your user-defined font. You must create and download all characters in a user-defined font at the same time. If you try to add other user-defined characters to an already existing user-defined font, you

erase previously created characters.

12. Write a command string to place the printer in Print mode:

<STX>R<ETX>

13. Save the text file and send it to the printer.

The user-defined font can now be used in a barcode label. You can specify the user-defined font for a human-readable or interpretive field. Characters in data you specify for those fields are mapped to the user-defined font.

This table lists the complete command string set for the user-defined font in this example.

Commands	Definitions
<STX><ESC>C<ETX>	Selects Advanced mode.
<ESC>P;<ETX>	Enters Program mode.
<STX>T3,FONT3<ETX>	Create bitmap font 3.
<STX>x10;y14;<ETX>	Define cell width (10) and cell height (14).
<STX>t36;Z12;<ETX>	Create ASCII character 36 ($), define character width as 12.
<STX>u0,lq@;<ETX>	Defines column 0.
<STX>u1,~sA;<ETX>	Defines column 1.
<STX>u2,FcA;<ETX>	Defines column 2.
<STX>u3,FcA;<ETX>	Defines column 3.
<STX>u4,<DEL><DEL>C;<ETX>	Defines column 4.
<STX>u5,<DEL><DEL>C;<ETX>	Defines column 5.
<STX>u6,FcA;<ETX>	Defines column 6.
<STX>u7,FcA;<ETX>	Defines column 7.
<STX>u8,N<DEL>A;<ETX>	Defines column 8.
<STX>u9,L~@;<ETX>	Defines column 9.
<STX>R;<ETX>	Saves and exits to Print mode.

Replace an Existing Font with Font Aliasing

You can use font aliasing to replace legacy bitmap fonts in your format with system fonts and user-defined fonts currently available on the printer. Font aliasing enables your printer to recognize the name of the original font and replace it everywhere with a TrueType font that matches closely with the former bitmap font.

1. Open a text editor and create a file named IPLFNT.ALS.

2. In the text file, create a script using the font aliasing syntax. You can write a script for each font you want to replace. Make sure to separate each script with a carriage return.

3. Save the IPLFNT.ALS file in the same directory as the fonts directory on the printer: /home/user/fonts.

4. Send the file to your printer using the file transfer protocol (FTP).

5. Reboot the printer.

Example

<ID>5<FNTNAME>font1<SYSFONT>Andale Mono<POINT>12<HEIGHT>1<WIDTH>1

This table describes the commands and parameters for the font aliasing script:

Command	Description
<ID>	*m1*: The user-defined font ID number (3 to 6, 8 to 19) or resident font ID number. *m2*: (optional) Intercharacter gap. Range is from 0 to 1000.
<FNTNAME>	The alphanumeric name used when the font is created or the name used to select the font.
<SYSFONT>	The printer system TrueType font that you want to use to replace the font.
<POINT>	The point size of the font to use for printing.
<HEIGHT>	The font height as a percentage of the base to width enlargement. Range: 1 to 1000.
<WIDTH>	The font width relative to the height base as a percentage. Range: 1 to 1000.
<X-OFFSET>	Horizontal field origin position offset measured in dots.
<Y-OFFSET>	Vertical field origin position offset measured in dots.

See Also

Font Aliasing Example

ADVANCED PRINTER PROGRAMMING

This topic provides information to consider when programming your printer, including:

About Secondary Printer Modes

How to Design Pages

About Secondary Printer Modes

There are several secondary modes available that you can use to perform advanced printer programming.

Emulation Mode – Emulation mode, also called "86XX Emulation mode" in some printer manuals, lets you print barcode labels that were designed on an 86XX printer:

- Print resolution is in 10 mil dots.

- For Data Shift, precede international characters by <SUB> or select them by language.

- User-Defined Character (UDC) bitmaps are one bit per byte format.

Legacy Mode – Legacy mode lets you print barcode labels that were designed on legacy 3400/4420 printers.

Direct Graphics Mode – Direct Graphics mode allows the printer to receive a compressed bitmap graphic and image it directly into the image bands without storing it in the printer.

About Secondary Printer Modes

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About Legacy Mode

[Legacy mode](#) lets you print barcode labels that were designed on legacy 3400/4420 printers. Legacy mode changes the font spacing as shown in these labels.

Sample Label with Legacy Mode Enabled

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXX   XXXXX   XXXXX   XXXXX   X

XXXXXXXXX   XXXXX   XXXXXXXXXX

XXXXX   LEGACY MODE ENABLED   XXXXXc26

Sample Label with Legacy Mode Disabled

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXX   XXXXX   XXXXX   XXXXX   X

XXXXXXXXX   XXXXX   XXXXXXXXXX

XXXXX   LEGACY MODE DISABLED XXXXXc26

About Direct Graphics Mode

You can significantly reduce the amount of time necessary to download and image a graphic by using Direct Graphics mode. Direct Graphics mode allows the printer to receive a compressed bitmap graphic and image it directly into the image bands without storing it in the printer.

Before you download the graphic, you must compress it into run-length encoded (RLE) data. The data compression greatly reduces the amount of data to download and the rasterized graphic requires minimal processing to image it into the image bands. You no longer need to store the graphic in Program mode, and then set up a format in Print mode.

When you download a direct graphic to the printer, the printer stores the graphic in the image bands until you:

- clear the label data.

- set up another format.

- enter Program mode or Test and Service mode.

When printing a label with direct graphics, you must have enough dynamic RAM installed in your printer to contain the entire label. Because Honeywell printers normally reuse image bands, you can print long labels with standard RAM; however, when you download direct graphics, the printer retains no information regarding the existence of the graphic in its image bands. Therefore, the printer cannot reuse those image bands when you download a direct graphic.

Understand Run-Length Encoding

Run-length encoding (RLE) is a method of compressing bitmap graphics. RLE compresses graphics that have repeated runs of white or black dots in a column, reducing the amount of time required to download the graphics to a printer.

RLE sends a series of commands that define each bitmap column of a graphic and takes advantage of a series of repeated dots within a column by encoding them as transition commands. Instead of sending the entire column of bitmap data, it sends commands telling the printer how many series of black and white dots to image.

If columns are identical, a command can instruct the printer to repeat the last column. RLE is ideal for barcode graphics or designs with simple patterns.

In cases where patterns do not exist, you can send uncompressed bitmap data to the printer. You can mix raw bitmap data and RLE commands to ensure the most efficient way to download a graphic.

The RLE file may contain five types of data, each of which is one byte long.

Type of Data	Description
Immediate Commands	Recognized and executed as regular IPL commands or protocol commands. Syntax is removed from compressed data. • Byte format (7-0): 000xxxx • Range: 0-31
Compression Encoding Commands	Used as part of the compressed graphics file to change or set data modes, repeat lines, change the origin for the next lines of data, or end the compressed graphics file and return to IPL command printing. • Byte format (7-0): 000xxxx • Range: 32-63
Low Order Data	Can represent up to 7 bits of data (0 to 127). Must be preceded by a command byte so the printer knows how to interpret them. • 7 bits long and may be combined with high order data. Eighth bit is always set to 1. • Byte format (7 - 0): 1xxxxxx • Range: 128 - 255
High Order Data	When combined with low order data, can represent up to 13 bits of data (0 - 8191). Must be preceded by a command byte so the printer knows how to interpret them. Printer ignores high order data followed by a command or more high order data. • 6 bits long and always combined with low order data. Seventh bit is always set to 1 and 8th bit is always set to 0. • Byte format (7 - 0): 01xxxxx • Range: 64 - 127 • Data represented: 0-63
Bitmap Data	Composed of uncompressed bytes (7 data bits per byte) that represent columns of your graphic. Eight bit is always set to 1. • Byte format (7 - 0): 1xxxxxx • Range: 128 - 255 • Data represented: Raw data

Example

This example consists of two parts: a graphic and a line. The origin of the direct graphic is defined the same as the origin of a normal graphic. The coordinates for the origin of the complex graphic are 0,450; however, after you enter Direct Graphics

mode, your printer loads the information in the reverse y direction. Each column of the graphic loads from the bottom to the top. Y coordinates now start at 0 from the bottom left corner and increase in size as the data loads. So, the printer starts loading data for the complex graphic at 0,450 and loads up to 0,425. Likewise, the data for the line starts loading at 19,450 and loads up to 19,0.
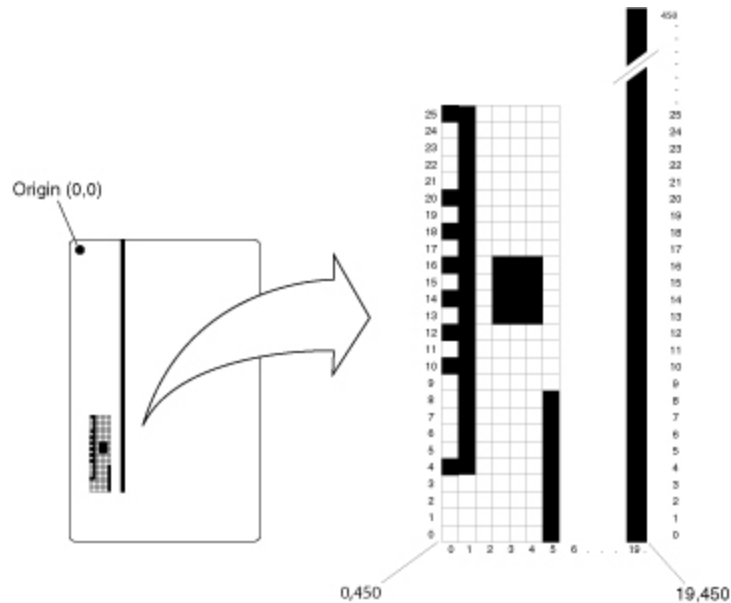
This table explains the hex data file in the example

1B	67	30	21	80	43	C2	27	90	A8	D5
90	22	26	84	96	22	22	26	8C	84	22
24	82	25	88	22	21	93	43	C2	25	43
C2	25									

This table explains the hex data file in the example.

Data	Command	Description
1B 67 30	<ESC>g0	Enter Direct Graphics mode
21 80 43 C2	0x21 80 43 C2	Change origin 80 – 80 (LO) = 0x00 –> X0 43 – 40 (HI) = 0x03 C2 – 80 (LO) = 0x42 (0x03 * 0x80) + 0x42 = 1C2 –> Y450

Data	Command	Description
27 90 A8 D5 90 22	0x27 90 A8 D5 90 0x22	Raw bitmap data follows, starts at Y0 90 – 80 (LO) = 0x10 –> 1 dot at Y4 A8 – 80 (LO) = 0x28 –> 2 dots at Y10 and Y12 D5 – 80 (LO) = 0x45 –> 3 dots at Y14, Y17, and Y20 90 – 80 (LO) = 0x10 –> 1 dot at Y25 End of line
26 84 96 22	0x26 84 96 0x22	Transition white 84 – 80 (LO) = 4 white 96 – 80 (LO) = 22 black End of line
22	0X22	End of Line
26 8D 84 22	0x26 8D 84 0x22	Transition white 8D – 80 (LO) = 13 white 84 – 80 (LO) = 4 black End of line
24 82	0x24 82	Repeat last line 82 – 80 (LO) = 2 times
25 88 22	0x25 88 0x22	Transition black 89 – 80 (LO) = 9 black End of line
21 93 43 C2	0x21 93 43 C2	Change origin 93 – 80 (LO) = 0x13 –> X19 43 – 40 (HI) = 0x03 C2 – 80 (LO) = 0x42 (0x03 *0x80) + 0x42 = 1C2 –> Y450
25 43 C2	0x25 43 C2	Transition black 43 – 40 (HI) = 0x03 C2 – 80 (LO) = 0x42 (0x03 * 080) + 0x42 = 1C2 –> Y450
28	0x28	End of bitmap

Direct Graphics Mode Commands

Use [Direct Graphics Mode, Select](#) to place the printer in Direct Graphics mode before you send these commands:

Syntax	Name
0x21	[Direct Graphics Mode, Change Origin](#)
0x22	[Direct Graphics Mode, End of Line](#)
0x24	[Direct Graphics Mode, Repeat Last Line](#)
0x25	[Direct Graphics Mode, Transition Black](#)
0x26	[Direct Graphics Mode, Transition White](#)
0x27	[Direct Graphics Mode, Raw Bitmap Data Follows](#)
0x28	[Direct Graphics Mode, End of Bitmap](#)

Direct Graphics Mode, Change Origin

Purpose

Tells the printer where to place the graphic in the label format by specifying the x and y coordinates of the next RLE data column. You can use the command to place different sections of the RLE graphic in different parts of the label.

This command is ignored unless preceded by [Direct Graphics Mode, Select](#).

Syntax

0x21[*x,y*]

Parameters

x, y

Coordinates of the next data column.

Range: 0 to 8191, 0 to 8191

Default: 0,0

Note: *You do not need to use this command for every column. Column-to-column transitions are automatic following the end of line command. The default origin (0,0) of any direct graphic is in the lower left corner, not the upper left corner like the label format origin.*

Direct Graphics Mode, End of Bitmap

Purpose

Marks the end of RLE encoded data.

This command is ignored unless preceded by [Direct Graphics Mode, Select]().

Syntax

0x28

Note: *The printer parses subsequent characters as IPL commands. On the final column of the RLE encoded data, [End of Line]() does not need to precede the end of bitmap command.*

Direct Graphics Mode, End of Line

Purpose

Causes the printer to assign subsequent bitmap data to the next column.

This command is ignored unless preceded by [Direct Graphics Mode, Select](#).

Syntax

0x22

Note: *The printer images the next data stream in the next column position, incrementing the x position. This command causes an action similar in function to a carriage return.*

Direct Graphics Mode, Raw Bitmap Data Follows

Purpose

Indicates raw bitmap data bytes follow.

This command is ignored unless preceded by <u>Direct Graphics Mode, Select</u>.

Syntax

0x27[*data*]

Parameters

data

RLE encoded bitmap data bytes that describe where to print.

Note: *The printer only uses the first 7 bits of the data byte. If you set a bit to 1, it prints black. The most significant bit prints farthest to the left. Data order runs from right to left, so the first dot in a column is the least significant bit of the first data byte.*

Direct Graphics Mode, Repeat Last Line

Purpose

Copies the previously defined column a specified number of times.

This command is ignored unless preceded by Direct Graphics Mode, Select.

Syntax

0x24*n*

Parameters

n

Number of times to copy the previously defined column.

Range: 0 to 8191

Note: *The printer automatically increments the x origin of each column. This command is only valid when preceded by a column of encoded, raw data or by End of Line.*

Direct Graphics Mode, Select

Purpose

Allows you to download graphic images directly into image memory without storing them in non–volatile RAM.

Supported Printers

All

Syntax

<ESC>g*m*

Parameters

m

Specifies the format of the data to follow:

m	Format
0	8 bits per byte
1	8 bits per byte that have been nibblized

Note: *When the printer is in Direct Graphics mode, the printer treats all Immediate commands as Direct Graphics Mode commands.*

Direct Graphics Mode, Transition Black

Purpose

Transition data follows. The first transition is black.

This command is ignored unless preceded by [Direct Graphics Mode, Select](#).

Syntax

0x25[*data*,*data*,...*data*]

Parameters

data

Specifies the number of black or white dots to draw. First *data* specifies black dots and alternates between white and black thereafter.

Range: 0 to 8191

Direct Graphics Mode, Transition White

Purpose

Transition data follows. The first transition is white.

This command is ignored unless preceded by [Direct Graphics Mode, Select](#).

Syntax

0x26[*data*,*data*,...*data*]

Parameters

data

Specifies the number of white or black dots to draw. First *data* specifies white dots and alternates between black and white thereafter.

Range: 0 to 8191

How to Design Pages

A page is a collection of one or more formats that you combine to print at the same time. This feature is helpful when you need to print several different labels for an application at once. For example, you may need to attach one type of label to a product and a different type of label to its container. With the page printing capability, you can print both labels at the same time. Because you can print pages of several formats at once, you can also print labels on media rolls that have different sizes and shapes of labels already pre-cut.

When you group label formats into a page, you assign the formats to positions designated by the letters a through z. You can print the formats used in pages independent of each other.

COMMAND FORMATS AND SYNTAX

An IPL command is a text string that you send to the printer. A command string is a combination of ASCII control codes (or their readable equivalents) and ASCII characters representing the specific command and associated data.

If the printer is in XON/XOFF mode, command strings do not need to end with <ETX>.

All command syntax is case sensitive. Each string must begin with the start of text character (<STX>) and must end with the end of text (<ETX>) character. For example, a simple command string can look like:

<STX>E2<ETX>

Using the Command Terminator

The semicolon (;) is the command terminator for Program or Test and Service commands. Command strings that include these commands must always end with ; except for the last command in a string. For example, a simple command string using Program commands can look like:

<STX>E2;F2;T4<ETX>

Using ASCII Control Characters in Program Mode Commands

When you design label formats, you use Program Mode commands to send format information to the printer. These commands require ASCII control characters in your command strings. To create ASCII control characters, you can:

• type the readable characters. Instead of using control codes, you enter the appro-
  priate string of characters enclosed in angle brackets. For example, instead of enter-
  ing control code 02, you type the readable characters <STX>.

• enter a control code. Some word processing programs allow you to represent ASCII
  control characters by entering the appropriate control code. For example, instead of
  entering control code 02, you type the characters ^B.

This example shows the same command string written with readable characters or with control codes:

• Readable characters: <STX><SI>g1,567<ETX>
• Control codes: ^B^Og1,567^C

For simplicity, this manual uses readable characters in all examples and syntax.

About IPL Command Syntax

This table describes how to interpret IPL command syntax.

Convention	Description
< >	Angle brackets < > enclose mnemonic representations of ASCII control characters. For example, <ETX> represents the ASCII "End of Text" control character. <ETX> also represents the "readable character" version of the control character.
data	Italic text represents variable data, which you must replace with a real value. For example, *n* signifies a variable for which you must designate a constant value.
[*data*]	Italic text within brackets represents optional data.

Commands Listed by Name

Command Name	Syntax
802.11 Security Type, Set	<SI>ws,SECURITY TYPE
802.11 Security Type, Transmit	<SI>wt,SECURITY TYPE
Abort Print Job	<EM>
Access Point Information, Transmit	<SI>wt,ACCESS POINT MAC
Acquire PAC, Set	<SI>ws,ACQUIRE PAC
Acquire PAC, Transmit	<SI>wt,ACQUIRE PAC
Active Channel, Set	<SI>ws,CHANNEL
Active Channel, Transmit	<SI>wt,CHANNEL
Advanced Mode, Select	<ESC>C
All Bluetooth Settings, Transmit	<SI>Bt
All Settings, Transmit (Wireless LAN or 802.1x)	<SI>wt
Alphanumeric Field Separator	<GS>
Anonymous Name, Set	<SI>ws,ANONYMOUS NAME
Anonymous Name, Transmit	<SI>wt,ANONYMOUS NAME
Association, Set	<SI>ws,ASSOCIATION
Association, Transmit	<SI>wt,ASSOCIATION
Auto-Transmit 1, Enable	<ESC>j
Auto-Transmit 2, Enable	<ESC>d
Auto-Transmit 3, Enable	<ESC>e
Auto-Transmit 1, 2, and 3, Disable	<ESC>k
Barcode, Select Type	c
Barcode Field, Create or Edit	B
Batch Count, Set	<US>
Battery Low Voltage Threshold, Set	<SI>V
Battery Status and Information, Transmit	<ESC>V
Bitmap Cell Height for Graphic or UDF, Define	y
Bitmap Cell Width for Graphic or UDF, Define	x
Bitmap User-Defined Font, Clear or Define	T
Border Around Human-Readable Text, Define	b

Command Name	Syntax
Box Field, Create or Edit	W
Certificate Authority, Set	<SI>ws,CA CERTIFICATE
Certificate Authority, Transmit	<SI>wt,CA CERTIFICATE
Change Password	<SI>xp
Change User	<SI>xu
Character Bitmap Origin Offset, Define	X
Character Rotation or Barcode Ratio, Define	r
Clear All Data	<CAN>
Clear Data From Current Field	<DEL>
Client Key, Set	<SI>ws,CLIENT KEY
Client Key, Transmit	<SI>wt,CLIENT KEY
Command Terminator	;
Command Terminator 1	<NUL>
Command Terminator 2	<LF>
Communication Port Configuration, Set	<SI>P
Configuration Parameters, Transmit	<ESC>p
Control Panel Access Permission, Set	<SI>A
Cut	<SO>
Cutter, Enable or Disable	<SI>c
Dark Adjust	K
Dark Adjust, Set	<SI>d
Data Shift – International Characters	<SUB>
Data Source for Format in a Page, Define	e
Date or Time, Set	<SI>q
Date or Time, Transmit	<ESC>q
Device Address, Transmit	<SI>Bt,DEVICE ADDRESS
Device Name, Set	<SI>Bs,DEVICE NAME
Device Name, Transmit	<SI>Bt,DEVICE NAME
Direct Graphics Emulation Mode, Enable or Disable	<SI>o
Direct Graphics Mode, Change Origin	0x21

Command Name	Syntax
Direct Graphics Mode, End of Bitmap	0x28
Direct Graphics Mode, End of Line	0x22
Direct Graphics Mode, Raw Bitmap Data Follows	0x27
Direct Graphics Mode, Repeat Last Line	0x24
Direct Graphics Mode, Select	<ESC>g
Direct Graphics Mode, Transition Black	0x25
Direct Graphics Mode, Transition White	0x26
Discoverable State, Set	<SI>Bs,DISCOVER
Discoverable State, Transmit	<SI>Bt,DISCOVER
Display Current User	<ESC>.x,whoami
Emulation Mode, Enter	<ESC>c
Emulation or Advanced Mode on Power–Up	<SI>C
Encryption, Set	<SI>Bs,ENCRYPT
Encryption, Transmit	<SI>Bt,ENCRYPT
End-of-Print Skip Distance, Set	<SI>D
Error Code, Request	<BEL>
Execute Shell Commands	<ESC>.x
Exit and Close IPL	QUITIPL
Factory Defaults, Reset	D
Field, Delete	D
Field, Select	<ESC>F
Field Data, Define Source	d
Field Decrement, Set	<ESC>D
Field Direction, Define	f
Field Increment, Set	<ESC>I
Field Origin, Define	o
First Data Entry Field, Select	<ACK>
Font, Transmit	<ESC>v
Font Character Width, Define	Z
Font Type, Select	c

Command Name	Syntax
Form Feed	<FF>
Format, Create or Edit	A or F
Format, Erase	E
Format, Select	<ESC>E
Format, Transmit	<ESC>x
Format Direction in a Page, Define	q
Format Offset Within a Page, Define	O
Format Position From Page, Delete	m
Format Position in a Page, Assign	M
Formats, Print	f
Graphic, Select	c
Graphic or UDC, Define	u
Hardware Configuration Label, Print	h
Height Magnification of Bar, Box, or UDC, Define	h
Hidden SSID, Set	<SI>ws, HIDDEN SSID
Hidden SSID, Transmit	<SI>wt, HIDDEN SSID
Human-Readable Field, Create or Edit	H
Ignore a List of Configuration Commands, Enable or Disable	<SI>xc
Increment and Decrement, Disable	<ESC>N
Inner Authentication, Set	<SI>ws,INNER AUTHENTICATION
Inner Authentication, Transmit	<SI>wt,INNER AUTHENTICATION
Intercharacter Space for UDF, Define	z
Interpretive Field, Edit	I
Interpretive Field, Enable or Disable	i
Label and Gap Length, Transmit	<ESC>L
Label Origin, X-Y Adjust	<SI>X
Label Rest Point, Adjust	<SI>f
Label Retract, Enable or Disable	<SI>R

IPL Command Reference

Command Name	Syntax
Label Retract Distance, Set	<SI>r
Label Stock Type, Select	<SI>T
Label Width, Set	<SI>W
Length of Line or Box Field, Define	l (lowercase L)
Line Field, Create or Edit	L
Maximum Label Length, Set	<SI>L
Media Fault Recovery Mode, Set	<SI>e
Media Sensitivity, Select	<SI>g
Memory Usage, Transmit	<ESC>m
Network Key, Set	<SI>ws,NETWORK KEY 1 <SI>ws,NETWORK KEY 2 <SI>ws,NETWORK KEY 3 <SI>ws,NETWORK KEY 4
Network Key, Transmit	<SI>wt,NETWORK KEY 1 <SI>wt,NETWORK KEY 2 <SI>wt,NETWORK KEY 3 <SI>wt,NETWORK KEY 4
Network Key Index, Set	<SI>ws,NETWORK KEY INDEX
Network Key Index, Transmit	<SI>wt,NETWORK KEY INDEX
Network Name (SSID), Set	<SI>ws,NETWORK NAME (SSID)
Network Name (SSID), Transmit	<SI>wt,NETWORK NAME (SSID)
Network Type, Set	<SI>ws,NETWORK TYPE
Network Type, Transmit	<SI>wt,NETWORK TYPE
Next Data Entry Field, Select	<CR>
Numeric Field Separator	<FS>
Options Selected, Transmit	<ESC>O
Page, Create or Edit	S
Page, Delete	s
Page, Select	<ESC>G
Page, Transmit	<ESC>y

Command Name	Syntax
Pages, Print	p
Passkey, Set	<SI>Bs,.PASS KEY
Passkey, Transmit	<SI>Bt,.PASS KEY
Point Size, Set	k
Postamble, Set	<EOT>
Power Management Mode, Set	<SI>ws,POWER MODE
Power Management Mode, Transmit	<SI>wt,POWER MODE
Power Saving Mode, Set	<SI>Bs
Preamble, Set	<SOH>
Print	<ETB>
Print Quality Label, Print	Q
Print Speed, Set	<SI>S
Printer Language, Select	<SI>l
Printhead Loading Mode, Select	<SI>h
Printhead Parameters, Transmit	<ESC>H
Program Mode, Enter	<ESC>P
Program Mode, Exit	R
Protected Access Credential, Set	<SI>ws,PAC
Protected Access Credential, Transmit	<SI>wt,PAC
Quantity Count, Set	<RS>
Region, Transmit	<SI>wt,.REGION
Remaining Quantity and Batch Count, Transmit	<ESC>Q
Reserve Printer, Set	<SI>Bs,RESERVE
Reserve Printer, Transmit	<SI>Bt,RESERVE
Reset	<DLE>
RFID Parameters, Set	<SI>J
RFID Tag, Read	<ESC>J
RFID Tag Field Setup	a
RFID Tag Void Text, Set	<SI>K
RFID Tag Write Field, Create or Edit	Q

Command Name	Syntax
Roaming Bias, Set	<SI>ws,ROAMING
Roaming Bias, Transmit	<SI>wt,ROAMING
Security, Set	<SI>Bs,SECURITY
Security, Transmit	<SI>Bt,SECURITY
Self-Strip, Enable or Disable	<SI>t
Server Common Name 1, Set	<SI>ws,.SERVER COMMON NAME 1
Server Common Name 1, Transmit	<SI>wt,.SERVER COMMON NAME 1
Server Common Name 2, Set	<SI>ws,.SERVER COMMON NAME 2
Server Common Name 2, Transmit	<SI>wt,.SERVER COMMON NAME 2
Setting Network Parameters in Manual Mode	<SI>n
Signal Strength, Transmit	<SI>wt,SIGNAL
Slash Zero, Enable or Disable	<SI>z
Software Configuration Label, Print	s
Speed, Transmit	<SI>wt,SPEED
Start and Stop Codes (Code 39), Print	<ESC><SP>
Status Dump	<VT>
Status Enquiry	<ENQ>
Test and Service Mode, Enter	<ESC>T
Test and Service Mode, Exit	R
Text Box, Create	x
Text Box, Set Justification	j
Text Box, Set Margins	m
Top of Form, Set	<SI>F
User Name, Set	<SI>ws,USER NAME
User Name, Transmit	<SI>wt,USER NAME
User Password, Set	<SI>ws,USER PASSWORD
User Password, Transmit	<SI>wt,USER PASSWORD

Command Name	Syntax
User–Defined Characters (UDC) and Graphics, Print	g
User–Defined Character, Clear or Create	G
User–Defined Character Field, Create or Edit	U
User–Defined Characters, Transmit	<ESC>u
User–Defined Font Character, Create	t
User–Defined Fonts, Print	t
Validate, Set	<SI>ws,VALIDATE CERTIFICATE
Validate, Transmit	<SI>wt,VALIDATE CERTIFICATE
Version Number, Transmit	<ESC>M
Warm Boot	<BS>
Width of Line, Box, Bar, or Character, Define	w

Commands Listed by Syntax

Syntax	Command Name
;	Command Terminator
<ACK>	First Data Entry Field, Select
<BEL>	Error Code, Request
<BS>	Warm Boot
<CAN>	Clear All Data
<CR>	Next Data Entry Field, Select
<DEL>	Clear Data From Current Field
<DLE>	Reset
<EM>	Abort Print Job
<ENQ>	Status Enquiry
<EOT>	Postamble, Set
<ESC><SP>	Start and Stop Codes (Code 39), Print
<ESC>C	Advanced Mode, Select
<ESC>c	Emulation Mode, Enter
<ESC>D	Field Decrement, Set
<ESC>d	Auto-Transmit 2, Enable
<ESC>E	Format, Select
<ESC>e	Auto-Transmit 3, Enable
<ESC>F	Field, Select
<ESC>G	Page, Select
<ESC>g	Direct Graphics Mode, Select
<ESC>H	Printhead Parameters, Transmit
<ESC>I	Field Increment, Set
<ESC>J	RFID Tag, Read
<ESC>j	Auto-Transmit 1, Enable
<ESC>k	Auto-Transmit 1, 2, and 3, Disable
<ESC>L	Label and Gap Length, Transmit
<ESC>M	Version Number, Transmit
<ESC>m	Memory Usage, Transmit

Syntax	Command Name
<ESC>N	Increment and Decrement, Disable
<ESC>O	Options Selected, Transmit
<ESC>P	Program Mode, Enter
<ESC>p	Configuration Parameters, Transmit
<ESC>Q	Remaining Quantity and Batch Count, Transmit
<ESC>q	Date or Time, Transmit
<ESC>T	Test and Service Mode, Enter
<ESC>u	User-Defined Characters, Transmit
<ESC>V	Battery Status and Information, Transmit
<ESC>v	Font, Transmit
<ESC>x	Format, Transmit
<ESC>.x	Execute Shell Commands
<ESC>.x,whoami	Display Current User
<ESC>y	Page, Transmit
<ETB>	Print
<FF>	Form Feed
<FS>	Numeric Field Separator
<GS>	Alphanumeric Field Separator
<LF>	Command Terminator 2
<NUL>	Command Terminator 1
<RS>	Quantity Count, Set
<SI>A	Control Panel Access Permission, Set
<SI>Bs	Power Saving Mode, Set
<SI>Bs,DEVICE NAME	Device Name, Set
<SI>Bs,DISCOVER	Discoverable State, Set
<SI>Bs,ENCRYPT	Encryption, Set
<SI>Bs,.PASS KEY	Passkey, Set
<SI>Bs,RESERVE	Reserve Printer, Set
<SI>Bs,SECURITY	Security, Set
<SI>Bt	All Bluetooth Settings, Transmit

Syntax	Command Name
<SI>Bt,DEVICE ADDRESS	Device Address, Transmit
<SI>Bt,DEVICE NAME	Device Name, Transmit
<SI>Bt,DISCOVER	Discoverable State, Transmit
<SI>Bt,ENCRYPT	Encryption, Transmit
<SI>Bt,.PASS KEY	Passkey, Transmit
<SI>Bt,RESERVE	Reserve Printer, Transmit
<SI>Bt,SECURITY	Security, Transmit
<SI>C	Emulation or Advanced Mode on Power-Up
<SI>c	Cutter, Enable or Disable
<SI>D	End-of-Print Skip Distance, Set
<SI>d	Dark Adjust, Set
<SI>e	Media Fault Recovery Mode, Set
<SI>F	Top of Form, Set
<SI>f	Label Rest Point, Adjust
<SI>g	Media Sensitivity, Select
<SI>h	Printhead Loading Mode, Select
<SI>J	RFID Parameters, Set
<SI>K	RFID Tag Void Text, Set
<SI>L	Maximum Label Length, Set
<SI>l	Printer Language, Select
<SI>n	Setting Network Parameters in Manual Mode
<SI>o	Direct Graphics Emulation Mode, Enable or Disable
<SI>P	Communication Port Configuration, Set
<SI>q	Date or Time, Set
<SI>R	Label Retract, Enable or Disable
<SI>r	Label Retract Distance, Set
<SI>S	Print Speed, Set
<SI>T	Label Stock Type, Select
<SI>t	Self-Strip, Enable or Disable
<SI>V	Battery Low Voltage Threshold, Set

Syntax	Command Name
<SI>W	Label Width, Set
<SI>ws,ACQUIRE PAC	Acquire PAC, Set
<SI>ws,ANONYMOUS NAME	Anonymous Name, Set
<SI>ws,ASSOCIATION	Association, Set
<SI>ws,CA CERTIFICATE	Certificate Authority, Set
<SI>ws,CHANNEL	Active Channel, Set
<SI>ws,CLIENT KEY	Client Key, Set
<SI>ws, HIDDEN SSID	Hidden SSID, Set
<SI>ws,INNER AUTHENTICATION	Inner Authentication, Set
<SI>ws,NETWORK KEY 1	Network Key, Set
<SI>ws,NETWORK KEY 2	Network Key, Set
<SI>ws,NETWORK KEY 3	Network Key, Set
<SI>ws,NETWORK KEY 4	Network Key, Set
<SI>ws,NETWORK KEY INDEX	Network Key Index, Set
<SI>ws,NETWORK NAME (SSID)	Network Name (SSID), Set
<SI>ws,NETWORK TYPE	Network Type, Set
<SI>ws,PAC	Protected Access Credential, Set
<SI>ws,POWER MODE	Power Management Mode, Set
<SI>ws,ROAMING	Roaming Bias, Set
<SI>ws,SECURITY TYPE	802.11 Security Type, Set
<SI>ws,.SERVER COMMON NAME 1	Server Common Name 1, Set
<SI>ws,.SERVER COMMON NAME 2	Server Common Name 2, Set
<SI>ws,USER NAME	User Name, Set
<SI>ws,USER PASSWORD	User Password, Set
<SI>ws,VALIDATE CERTIFICATE	Validate, Set
<SI>wt	All Settings, Transmit (Wireless LAN or 802.1x)

Syntax	Command Name
<SI>wt,ACCESS POINT MAC	Access Point Information, Transmit
<SI>wt,ACQUIRE PAC	Acquire PAC, Transmit
<SI>wt,ANONYMOUS NAME	Anonymous Name, Transmit
<SI>wt,ASSOCIATION	Association, Transmit
<SI>wt,CA CERTIFICATE	Certificate Authority, Transmit
<SI>wt,CHANNEL	Active Channel, Transmit
<SI>wt,CLIENT KEY	Client Key, Transmit
<SI>wt, HIDDEN SSID	Hidden SSID, Transmit
<SI>wt,INNER AUTHENTICATION	Inner Authentication, Transmit
<SI>wt,NETWORK KEY 1	Network Key , Transmit
<SI>wt,NETWORK KEY 2	Network Key , Transmit
<SI>wt,NETWORK KEY 3	Network Key , Transmit
<SI>wt,NETWORK KEY 4	Network Key , Transmit
<SI>wt,NETWORK KEY INDEX	Network Key Index, Transmit
<SI>wt,NETWORK NAME (SSID)	Network Name (SSID), Transmit
<SI>wt,NETWORK TYPE	Network Type, Transmit
<SI>wt,PAC	Protected Access Credential, Transmit
<SI>wt,POWER MODE	Power Management Mode, Transmit
<SI>wt,.REGION	Region, Transmit
<SI>wt,ROAMING	Roaming Bias, Transmit
<SI>wt,SECURITY TYPE	802.11 Security Type, Transmit
<SI>wt,.SERVER COMMON NAME 1	Server Common Name 1, Transmit
<SI>wt,.SERVER COMMON NAME 2	Server Common Name 2, Transmit
<SI>wt,SIGNAL	Signal Strength, Transmit
<SI>wt,SPEED	Speed, Transmit
<SI>wt,USER NAME	User Name, Transmit
<SI>wt,USER PASSWORD	User Password, Transmit

Syntax	Command Name
<SI>wt,VALIDATE CERTIFICATE	Validate, Transmit
<SI>X	Label Origin, X-Y Adjust
<SI>xc	Ignore a List of Configuration Commands, Enable or Disable
<SI>xp	Change Password
<SI>xu	Change User
<SI>z	Slash Zero, Enable or Disable
<SO>	Cut
<SOH>	Preamble, Set
<SUB>	Data Shift – International Characters
<US>	Batch Count, Set
<VT>	Status Dump
A (or F)	Format, Create or Edit
a	RFID Tag Field Setup
B	Barcode Field, Create or Edit
b	Border Around Human–Readable Text, Define
c	Barcode, Select Type
c	Font Type, Select
c	Graphic, Select
D	Factory Defaults, Reset
D	Field, Delete
d	Field Data, Define Source
E	Format, Erase
e	Data Source for Format in a Page, Define
F (or A)	Format, Create or Edit
f	Field Direction, Define
f	Formats, Print
G	User–Defined Character, Clear or Create
g	User–Defined Characters and Graphics, Print
H	Human–Readable Field, Create or Edit

Syntax	Command Name
h	Hardware Configuration Label, Print
h	Height Magnification of Bar, Box, or UDC, Define
I	Interpretive Field, Edit
i	Interpretive Field, Enable or Disable
j	Text Box, Set Justification
K	Dark Adjust
k	Point Size, Set
L	Line Field, Create or Edit
l	Length of Line or Box Field, Define
M	Format Position in a Page, Assign
m	Format Position From Page, Delete
m	Text Box, Set Margins
O	Format Offset Within a Page, Define
o	Field Origin, Define
p	Pages, Print
Q	Print Quality Label, Print
Q	RFID Tag Write Field, Create or Edit
q	Format Direction in a Page, Define
QUITIPL	Exit and Close IPL
R	Program Mode, Exit
R	Test and Service Mode, Exit
r	Character Rotation or Barcode Ratio, Define
S	Page, Create or Edit
s	Page, Delete
s	Software Configuration Label, Print
T	Bitmap User–Defined Font, Clear or Define
t	User-Defined Font Character, Create
t	User-Defined Fonts, Print
U	User–Defined Character Field, Create or Edit
u	Graphic or UDC, Define

Syntax	Command Name
W	Box Field, Create or Edit
w	Width of Line, Box, Bar, or Character, Define
X	Character Bitmap Origin Offset, Define
x	Bitmap Cell Width for Graphic or UDF, Define
x	Text Box, Create
y	Bitmap Cell Height for Graphic or UDF, Define
Z	Font Character Width, Define
z	Intercharacter Space for UDF, Define
0x21	Direct Graphics Mode, Change Origin
0x22	Direct Graphics Mode, End of Line
0x24	Direct Graphics Mode, Repeat Last Line
0x25	Direct Graphics Mode, Transition Black
0x26	Direct Graphics Mode, Transition White
0x27	Direct Graphics Mode, Raw Bitmap Data Follows
0x28	Direct Graphics Mode, End of Bitmap

Communications Commands

Use communications commands to set printer communications parameters. You can view these types of supported communications commands alphabetically by name or syntax:

[802.1x](#)

[Bluetooth](#)

[Wireless LAN](#)

802.1x Communications Commands

This table lists 802.1x commands by syntax. You can also see the supported commands listed alphabetically by name.

Syntax	Command Name
<SI>ws,ACQUIRE PAC	Acquire PAC, Set
<SI>ws,ANONYMOUS NAME	Anonymous Name, Set
<SI>ws,ASSOCIATION	Association, Set
<SI>ws,CA CERTIFICATE	Certificate Authority, Set
<SI>ws,INNER AUTHENTICATION	Inner Authentication, Set
<SI>ws,PAC	Protected Access Credential, Set
<SI>ws,.SERVER COMMON NAME 1	Server Common Name 1, Set
<SI>ws,.SERVER COMMON NAME 2	Server Common Name 2, Set
<SI>ws,USER NAME	User Name, Set
<SI>ws,USER PASSWORD	User Password, Set
<SI>ws,VALIDATE CERTIFICATE	Validate, Set
<SI>wt	All Settings, Transmit (802.1x or Wireless LAN)
<SI>wt,ACQUIRE PAC	Acquire PAC, Transmit
<SI>wt,ANONYMOUS NAME	Anonymous Name, Transmit
<SI>wt,ASSOCIATION	Association, Transmit
<SI>wt,CA CERTIFICATE	Certificate Authority, Transmit
<SI>wt,INNER AUTHENTICATION	Inner Authentication, Transmit
<SI>wt,PAC	Protected Access Credential, Transmit
<SI>wt,.SERVER COMMON NAME 1	Server Common Name 1, Transmit
<SI>wt,.SERVER COMMON NAME 2	Server Common Name 2, Transmit
<SI>wt,USER NAME	User Name, Transmit
<SI>wt,USER PASSWORD	User Password, Transmit
<SI>wt,VALIDATE CERTIFICATE	Validate, Transmit

Supported Commands Listed by Name

Command Name	Syntax
Acquire PAC, Set	<SI>ws,ACQUIRE PAC

Command Name	Syntax
Acquire PAC, Transmit	<SI>wt,ACQUIRE PAC
All Settings, Transmit (802.1x or Wireless LAN)	<SI>wt
Anonymous Name, Set	<SI>ws,ANONYMOUS NAME
Anonymous Name, Transmit	<SI>wt,ANONYMOUS NAME
Association, Set	<SI>ws,ASSOCIATION
Association, Transmit	<SI>wt,ASSOCIATION
Certificate Authority, Set	<SI>ws,CA CERTIFICATE
Certificate Authority, Transmit	<SI>wt,CA CERTIFICATE
Inner Authentication, Set	<SI>ws,INNER AUTHENTICATION
Inner Authentication, Transmit	<SI>wt,INNER AUTHENTICATION
Protected Access Credential, Set	<SI>ws,PAC
Protected Access Credential, Transmit	<SI>wt,PAC
Server Common Name 1, Set	<SI>ws,.SERVER COMMON NAME 1
Server Common Name 1, Transmit	<SI>wt,.SERVER COMMON NAME 1
Server Common Name 2, Set	<SI>ws,.SERVER COMMON NAME 2
Server Common Name 2, Transmit	<SI>wt,.SERVER COMMON NAME 2
User Name, Set	<SI>ws,USER NAME
User Name, Transmit	<SI>wt,USER NAME
User Password, Set	<SI>ws,USER PASSWORD
User Password, Transmit	<SI>wt,USER PASSWORD
Validate, Set	<SI>ws,VALIDATE CERTIFICATE
Validate, Transmit	<SI>wt,VALIDATE CERTIFICATE

Bluetooth Communications Commands

These tables list Bluetooth commands alphabetically by syntax or name.

Supported Commands Listed by Syntax

Syntax	Command Name
<SI>Bt	All Bluetooth Settings, Transmit
<SI>Bt,DEVICE ADDRESS	Device Address, Transmit
<SI>Bs,DEVICE NAME	Device Name, Set
<SI>Bt,DEVICE NAME	Device Name, Transmit
<SI>Bs,DISCOVER	Discoverable State, Set
<SI>Bt,DISCOVER	Discoverable State, Transmit
<SI>Bs,.PASS KEY	Passkey, Set
<SI>Bt,.PASS KEY	Passkey, Transmit
<SI>Bs,POWER SAVING MODE	Power Saving, Set
<SI>Bs,RESERVE	Reserve Printer, Set
<SI>Bt,RESERVE	Reserve Printer, Transmit
<SI>Bs,SECURITY	Security, Set
<SI>Bt,SECURITY	Security, Transmit

Supported Commands Listed by Name

Command Name	Syntax
All Bluetooth Settings, Transmit	<SI>Bt
Device Address, Transmit	<SI>Bt,DEVICE ADDRESS
Device Name, Set	<SI>Bs,DEVICE NAME
Device Name, Transmit	<SI>Bt,DEVICE NAME
Discoverable State, Set	<SI>Bs,DISCOVER
Discoverable State, Transmit	<SI>Bt,DISCOVER
Passkey, Set	<SI>Bs,.PASS KEY
Passkey, Transmit	<SI>Bt,.PASS KEY
Power Saving Mode, Set	<SI>Bs,POWER SAVING MODE
Reserve Printer, Set	<SI>Bs,RESERVE

Command Name	Syntax
Reserve Printer, Transmit	<SI>Bt,RESERVE
Security, Set	<SI>Bs,SECURITY
Security, Transmit	<SI>Bt,SECURITY

Wireless LAN Communications Commands

This table lists Wireless LAN commands by syntax. You can also see the supported commands listed alphabetically by name.

Syntax	Command Name
<SI>ws,CHANNEL	Active Channel, Set
<SI>ws,CLIENT KEY	Client Key, Set
<SI>ws,HIDDEN SSID	Hidden SSID, Set
<SI>ws,NETWORK KEY 1 <SI>ws,NETWORK KEY 2 <SI>ws,NETWORK KEY 3 <SI>ws,NETWORK KEY 4	Network Key, Set
<SI>ws,NETWORK KEY INDEX	Network Key Index, Set
<SI>ws,NETWORK NAME (SSID)	Network Name (SSID), Set
<SI>ws,NETWORK TYPE	Network Type, Set
<SI>ws,POWER MODE	Power Management Mode, Set
<SI>ws,ROAMING	Roaming Bias, Set
<SI>ws,SECURITY TYPE	802.11 Security Type, Set
<SI>wt	All Settings, Transmit (Wireless LAN or 802.1x)
<SI>wt,ACCESS POINT MAC	Access Point Information, Transmit
<SI>wt,CHANNEL	Active Channel, Transmit
<SI>wt,CLIENT KEY	Client Key, Transmit
<SI>wt,HIDDEN SSID	Hidden SSID, Transmit
<SI>wt,NETWORK KEY 1 <SI>wt,NETWORK KEY 2 <SI>wt,NETWORK KEY 3 <SI>wt,NETWORK KEY 4	Network Key, Transmit
<SI>wt,NETWORK KEY INDEX	Network Key Index, Transmit
<SI>wt,NETWORK NAME (SSID)	Network Name (SSID), Transmit
<SI>wt,NETWORK TYPE	Network Type, Transmit
<SI>wt,POWER MODE	Power Management Mode, Transmit
<SI>wt,.REGION	Region, Transmit
<SI>wt,ROAMING	Roaming Bias, Transmit

Syntax	Command Name
<SI>wt,SECURITY TYPE	802.11 Security Type, Transmit
<SI>wt,SIGNAL	Signal Strength, Transmit
<SI>wt,SPEED	Speed, Transmit

Supported Commands Listed by Name

Command Name	Syntax
802.11 Security Type, Set	<SI>ws,SECURITY TYPE
802.11 Security Type, Transmit	<SI>wt,SECURITY TYPE
Access Point Information, Transmit	<SI>wt,ACCESS POINT MAC
Active Channel, Set	<SI>ws,CHANNEL
Active Channel, Transmit	<SI>wt,CHANNEL
Client Key, Set	<SI>ws,CLIENT KEY
Client Key, Transmit	<SI>wt,CLIENT KEY
Hidden SSID, Set	<SI>ws, HIDDEN SSID
Hidden SSID, Transmit	<SI>wt, HIDDEN SSID
Network Key, Set	<SI>ws,NETWORK KEY 1 <SI>ws,NETWORK KEY 2 <SI>ws,NETWORK KEY 3 <SI>ws,NETWORK KEY 4
Network Key, Transmit	<SI>wt,NETWORK KEY 1 <SI>wt,NETWORK KEY 2 <SI>wt,NETWORK KEY 3 <SI>wt,NETWORK KEY 4
Network Key Index, Set	<SI>ws,NETWORK KEY INDEX
Network Key Index, Transmit	<SI>wt,NETWORK KEY INDEX
Network Name (SSID), Set	<SI>ws,NETWORK NAME (SSID)
Network Name (SSID), Transmit	<SI>wt,NETWORK NAME (SSID)
Network Type, Set	<SI>ws,NETWORK TYPE
Network Type, Transmit	<SI>wt,NETWORK TYPE
Power Management Mode, Set	<SI>ws,POWER MODE
Power Management Mode, Transmit	<SI>wt,POWER MODE

Command Name	Syntax
Region, Transmit	<SI>wt,.REGION
Roaming Bias, Set	<SI>ws,ROAMING
Roaming Bias, Transmit	<SI>wt,ROAMING
Signal Strength, Transmit	<SI>wt,SIGNAL
Speed, Transmit	<SI>wt,SPEED

Configuration Commands

You can view configuration commands listed alphabetically:

by [name](#).

by [syntax](#).

Using Configuration Commands

Use configuration commands to set parameters for configuration features and to enable or disable options.

Configuration commands are effective when the printer is in Print mode. You can switch to Print mode with this command:

<STX>R<ETX>

When using configuration commands with printers with RFID modules, these commands affect how the RFID tag interacts with the printer.

Command Format

You must precede each string of commands with the start of message character <STX> and follow it with the end of message character <ETX>. The printer terminates a configuration command when it receives the next command in the message.

After reconfiguring your printer, you must cycle power or reset the printer for the commands to become effective unless otherwise specified.

Configuration Commands by Name

Command Name	Syntax
Commands Ignore, Enable or Disable	<SI>xc
Communication Port Configuration, Set	<SI>P
Control Panel Access Permission, Set	<SI>A
Cutter, Enable or Disable	<SI>c
Dark Adjust, Set	<SI>d
Date or Time, Set	<SI>q
Emulation or Advanced Mode on Power-Up	<SI>C
End-of-Print Skip Distance, Set	<SI>D
Label Origin, X-Y Adjust	<SI>X
Label Rest Point, Adjust	<SI>f
Label Retract, Enable or Disable	<SI>R
Label Retract Distance, Set	<SI>r
Label Stock Type, Select	<SI>T
Label Width, Set	<SI>W
Maximum Label Length, Set	<SI>L
Media Fault Recovery Mode, Set	<SI>e
Media Sensitivity, Select	<SI>g
Print Speed, Set	<SI>S
Printer Language, Select	<SI>l
Printhead Loading Mode, Select	<SI>h
RFID Parameters, Set	<SI>J
RFID Tag Void Text, Set	<SI>K
Self-Strip, Enable or Disable	<SI>t
Slash Zero, Enable or Disable	<SI>z
Top of Form, Set	<SI>F

Configuration Commands by Syntax

Syntax	Command
<SI>A	Control Panel Access Permission, Set
<SI>C	Emulation or Advanced Mode on Power-Up
<SI>c	Cutter, Enable or Disable
<SI>D	End-of-Print Skip Distance, Set
<SI>d	Dark Adjust, Set
<SI>e	Media Fault Recovery Mode, Set
<SI>F	Top of Form, Set
<SI>f	Label Rest Point, Adjust
<SI>g	Media Sensitivity, Select
<SI>h	Printhead Loading Mode, Select
<SI>J	RFID Parameters, Set
<SI>K	RFID Tag Void Text, Set
<SI>L	Maximum Label Length, Set
<SI>l	Printer Language, Select
<SI>o	Direct Graphics Emulation Mode, Enable or Disable
<SI>P	Communication Port Configuration, Set
<SI>q	Date or Time, Set
<SI>R	Label Retract, Enable or Disable
<SI>r	Label Retract Distance, Set
<SI>S	Print Speed, Set
<SI>T	Label Stock Type, Select
<SI>t	Self-Strip, Enable or Disable
<SI>W	Label Width, Set
<SI>X	Label Origin, X-Y Adjust
<SI>xc	Commands Ignore , Enable or Disable

Immediate Commands

You can view immediate commands listed alphabetically:

by name.

by syntax.

Using Immediate Commands

You can use immediate commands to:

- query the printer about the status of the printer.
- query the printer about any print jobs.
- abort print jobs.
- request error conditions.
- reset the printer.

Unlike other commands that the printer stores in the data buffer and executes in the order received, the printer executes immediate commands when it receives them, regardless of printer mode.

Immediate Commands by Name

Command Name	Syntax
Abort Print Job	<EM>
Error Code, Request	<BEL>
Execute Shell Commands	<ESC>.x
Exit and Close IPL	QUITIPL
Label and Gap Length, Transmit	<ESC>L
Remaining Quantity and Batch Count, Transmit	<ESC>Q
Reset	<DLE>
Status Dump	<VT>
Status Enquiry	<ENQ>

Immediate Commands by Syntax

Syntax	Command Name
<BEL>	Error Code, Request
<DLE>	Reset
<EM>	Abort Print Job
<ENQ>	Status Enquiry
<ESC>L	Label and Gap Length, Transmit
<ESC>Q	Remaining Quantity and Batch Count, Transmit
<ESC>.x	Execute Shell Commands
<VT>	Status Dump
QUITIPL	Exit and Close IPL

Print Commands

You can view print commands listed alphabetically:

by name.

by syntax.

Using Print Commands

You can use print commands to pass data to download data to the printer, print barcode labels or RFID tag labels, or pass data to RFID tag formats. Print commands are effective when the printer is in Print mode. You can switch to Print mode with this command:

<STX>R<ETX>

When you enter data into a format for printing, the printer uses a field pointer to designate the field in the format where the data should print. If you select a new format, the field pointer automatically points to the lowest numbered data entry field and continues to point to that field until you select a different field or format. If you select a field by using the <CR> (Next Data Entry Field, Select) or <ESC>F (Field, Select) command, new data entered into the field overwrites any data already existing in the field.

Command Format

You must precede each string of commands with the start of message character <STX> and follow it with the end of message character <ETX>. The next command in the message terminates all Print mode commands. The command separator (<NUL> or <LF>) is optional between commands, but is necessary to separate commands from data.

For example, to separate the <ESC>F command from data, type:

<ESC>F4<NUL>*data*

Print Commands by Name

Command Name	Syntax
[Advanced Mode, Select](#)	<ESC>C
[Alphanumeric Field Separator](#)	<GS>
[Batch Count, Set](#)	<US>
[Clear All Data](#)	<CAN>
[Clear Data From Current Field](#)	<DEL>
[Command Terminator 1](#)	<NUL>
[Command Terminator 2](#)	<LF>
[Configuration Parameters, Transmit](#)	<ESC>p
[Cut](#)	<SO>
[Cutter, Enable or Disable](#)	<SI>c
[Data Shift International Characters](#)	<SUB>
[Date or Time, Transmit](#)	<ESC>q
[Direct Graphics Mode, Change Origin](#)	0x21
[Direct Graphics Mode, End of Bitmap](#)	0x28
[Direct Graphics Mode, End of Line](#)	0x22
[Direct Graphics Mode, Raw Bitmap Data Follows](#)	0x27
[Direct Graphics Mode, Repeat Last Line](#)	0x24
[Direct Graphics Mode, Select](#)	<ESC>g
[Direct Graphics Mode, Transition Black](#)	0x25
[Direct Graphics Mode, Transition White](#)	0x26
[Emulation Mode, Enter](#)	<ESC>c
[Field, Select](#)	<ESC>F
[Field Decrement, Set](#)	<ESC>D
[Field Increment, Set](#)	<ESC>I
[First Data Entry Field, Select](#)	<ACK>
[Font, Transmit](#)	<ESC>v
[Form Feed](#)	<FF>
[Format, Select](#)	<ESC>E
[Format, Transmit](#)	<ESC>x

Command Name	Syntax
Increment and Decrement, Disable	<ESC>N
Memory Usage, Transmit	<ESC>m
Next Data Entry Field, Select	<CR>
Numeric Field Separator	<FS>
Options Selected, Transmit	<ESC>O
Page, Select	<ESC>G
Page, Transmit	<ESC>y
Print	<ETB>
Printhead Parameters, Transmit	<ESC>H
Program Mode, Enter	<ESC>P
Quantity Count, Set	<RS>
Remaining Quantity and Batch Count, Transmit	<ESC>Q
RFID Tag, Read	<ESC>J
Test and Service Mode, Enter	<ESC>T
User-Defined Characters, Transmit	<ESC>u
Version Number, Transmit	<ESC>M
Warm Boot	<BS>

Print Commands by Syntax

Syntax	Command Name
<ACK>	First Data Entry Field, Select
<BS>	Warm Boot
<CAN>	Clear All Data
<CR>	Next Data Entry Field, Select
<DEL>	Clear Data From Current Field
<ESC>C	Advanced Mode, Select
<ESC>c	Emulation Mode, Enter
<ESC>D	Field Decrement, Set
<ESC>E	Format, Select
<ESC>F	Field, Select
<ESC>G	Page, Select
<ESC>g	Direct Graphics Mode, Select
<ESC>H	Printhead Parameters, Transmit
<ESC>I	Field Increment, Set
<ESC>J	RFID Tag, Read
<ESC>M	Version Number, Transmit
<ESC>m	Memory Usage, Transmit
<ESC>N	Increment and Decrement, Disable
<ESC>O	Options Selected, Transmit
<ESC>P	Program Mode, Enter
<ESC>p	Configuration Parameters, Transmit
<ESC>Q	Remaining Quantity and Batch Count, Transmit
<ESC>q	Date or Time, Transmit
<ESC>T	Test and Service Mode, Enter
<ESC>u	User-Defined Characters, Transmit
<ESC>v	Font, Transmit
<ESC>x	Format, Transmit
<ESC>y	Page, Transmit
<ETB>	Print

Syntax	Command Name
<FF>	Form Feed
<FS>	Numeric Field Separator
<GS>	Alphanumeric Field Separator
<LF>	Command Terminator 2
<NUL>	Command Terminator 1
<RS>	Quantity Count, Set
<SO>	Cut
<SUB>	Data Shift – International Characters
<US>	Batch Count, Set
0x21	Direct Graphics Mode, Change Origin
0x22	Direct Graphics Mode, End of Line
0x24	Direct Graphics Mode, Repeat Last Line
0x25	Direct Graphics Mode, Transition Black
0x26	Direct Graphics Mode, Transition White
0x27	Direct Graphics Mode, Raw Bitmap Data Follows
0x28	Direct Graphics Mode, End of Bitmap

Program Mode Commands

You perform a specific task using one of these sets of commands:

[Barcode Field Editing Commands](#)

[Bitmap User-Defined Font Editing Commands](#)

[Box Field Editing Commands](#)

[Format Editing Commands](#)

[Human-Readable Field Editing Commands](#)

[Interpretive Field Editing Commands](#)

[Line Field Editing Commands](#)

[Page Editing Commands](#)

[Programming Commands](#)

[RFID Tag Editing Commands](#)

[User-Defined Character Editing Commands](#)

[User-Defined Character Field Editing Commands](#)

Using Program Mode Commands

Use program mode commands to:

- design label formats.

- download user-defined fonts and graphics.

Program mode commands are effective when the printer is in Program mode. You can switch the printer to Program mode with this command:

<STX><ESC>P<ETX>

When creating or editing formats, the printer uses a field pointer to designate the field to modify when the printer is in Program mode. To download commands in Program mode, you must specify the field you want to change. If you do not select a field, the pointer points to the last selected field until you select a different format or field. New formats contain a default human-readable field numbered H0. New pages do not contain a default format.

When using program mode commands with printers with RFID modules, these commands handle the interaction with the chip in the RFID tag. For example, you can use a command that specifies where data is written in the tag memory.

Program Mode: Barcode Field Editing Commands

Syntax	Command Name
c	Barcode, Select Type
d	Field Data, Define Source
f	Field Direction, Define
h	Height Magnification of Bar, Box, or UDC, Define
i	Interpretive Field, Enable or Disable
o	Field Origin, Define
r	Character Rotation or Barcode Ratio, Define
w	Width of Line, Box, Bar, or Character, Define

Barcode, Select Type

Purpose

Selects a symbology for a barcode field.

Supported Printers

All

Syntax

c*n*[,*m1*][,*m2*]...[,*mx*]

Parameters

n

Code for the symbology. Values for *n* are:

n	Symbology
0 (default)	Code 39
1	Code 93
2	Interleaved 2 of 5
3	Code 2 of 5
4	Codabar
5	Code 11
6	Code 128 / GS1-128
7	EAN/UPC
8	HIBC Code 39
9	Code 16K
10	Code 49
11	POSTNET
12	PDF417
14	MaxiCode
15	JIS-ITF
16	HIBC Code 128
17	DataMatrix
18	QR Code

n	Symbology
19	MicroPDF417
20	GS1 DataBar
21	GS1 Composite
22	Planet
23	Aztec
24	ISBT 128
25	USPS4CB

m1, *m2...mx*

Modifiers for a specific symbology:

m1

GS1-128 Composite Modifier

m1	Code Type
0	UCC/EAN-128 with CC-C (Default)
1	UCC/EAN-128 with CC-A or CC-B
2	EAN-13 with CC-A or CC-B
3	EAN-8 with CC-A or CC-B
4	UPC-A with CC-A or CC-B
5	UPC-E with CC-A or CC-B
6	GS1 Composite with CC-A or CC-B
7	GS1 Composite Truncated with CC-A or CC-B
8	GS1 Composite Stacked with CC-A or CC-B
9	GS1 Composite Stacked Omni directional with CC-A or CC-B
10	GS1 DataBar Limited with CC-A or CC-B
11	GS1 DataBar Expanded with CC-A or CC-B
12	GS1 DataBar Expanded Stacked with CC-A or CC-B

m2

EAN/UPC Modifier

m2	Code Type
1	EAN 8
2	EAN 13
3	UPC Version A
4	UPC Version E
5	UPC Version D1
6	UPC Version D2
7	UPC Version D3
8	UPC Version D4
9	UPC Version D5

Field Data, Define Source

Purpose

Defines a data source for the current field and the number of characters in the field.

Supported Printers

All

Syntax

d*n*[,*m1*][,*m2*]

Parameters

n

Defines the data source:

n	Data Source
0	Data entered in Print mode
1	Data entered in Print mode
2	Data comes from field, *m1*
3	Fixed data
4	Date (from the real-time clock) when the label was imaged.
5	Time (from the real-time clock) when the label was imaged.

m1

Varies depending on value of *n*.

Range: 0 to 3550

If *n* = 0 or 1, *m1* is the maximum number of characters you can enter in the field. For all supported printers, the default value is 20 (barcode fields) or 30 (human-readable fields).

If *n* = 4, *m1* indicates how the date is formatted:

m1	Format for Date
0	YY/MM/DD (default)
1	YYYY/MM/DD
2	DD/MM/YY
3	DD/MM/YYYY

If *n* = 5, *m1* indicates how the time is formatted:

m1	Format for Time
0	HH:MM:SS, 24–hour clock (default)
1	HH:MM, 24–hour clock
2	HH:MM:SS, 12–hour clock
3	HH:MM, 12–hour clock
4	HH:MM:SS am/pm, 12–hour clock
5	HH:MM am/pm, 12–hour clock

m2

(Optional) Varies depending on value of *n*.

If *n* = 0 to 3, *m2* is the positive integer numeric field offset.

Range: 0 to 9999

Default: 0

If *n* = 4, *m2* is the data offset.

Range: –3650 to 3650 (+/– 10 years)

Default: 0

If *n* = 5, *m2* is the data offset. Offsetting the time past midnight does not change the date.

Range: –86400 to 86400 (+/– 1 day)

Default: 0

Note: *Fields using the date or time as data are imaged when the print command is executed. Labels reprinted because of an error or fault condition will have the same time as the original label.*

Note: *Labels printed with the Batch Count, Set command will have the same time. To print a batch of labels with differing time stamps, use the Quantity Count, Set command.*

Note: *Data offset parameter of a slave of a date or time field is ignored.*

Example

These examples demonstrate the syntax for this command.

d0[,*m1*]

d1[,*m1*];

Enter optional data in Print mode. *m1* is the maximum amount of data that you can enter into this field. The default for *m1* is 20 characters for barcode fields, 30 characters for human-readable fields, and 64 characters for RFID fields.

For variable RFID fields, make sure to allow for field separator commands. Also, fields in hex format need at least twice as many characters as defined in the RFID tap setup command. For example, to write 4 hex bytes to a tag, you need to allow at least 8 characters in the variable data field.

d2,*m1*[,*m2*];

Copy data into this field from field *m1*. You must define the field before you can use it. *m2* is an optional positive integer numeric field offset that can range from 0 to 9999, with 0 as the default. You can only offset data delimited by numeric field separator <FS> or alphanumeric field separator <GS>. A barcode field cannot copy data from a human-readable field, but a human-readable field can copy data from a barcode field. You can use up to 19 slave fields in each format,

d3,*m1*;

Fixed data *m1* is stored as part of the format, and you use it every time you print the current field. You cannot change entered data with print commands.

Many formats divide data into separate fields, and then rearrange these fields to fit the RFID tag or composite barcodes. Use the <HT> character to divide the fields to enable you to enter the entire source data with one command.

d4,0;

Sets the field data source to the date according to the real-time clock, and prints the date as YYYY/MM/DD.

This example shows how to separate the fields with <HT>:

<STX>Q3;a3,1;d3,0<HT>4011661<HT>0030000001;<ETX>
<STX><ESC>J3,1<ETX>

Field Direction, Define

Purpose

Defines the field rotation.

Supported Printers

All

Syntax

f*n*

Parameters

n

Defines the field direction:

n	Field Direction
0	Horizontal (default)
1	Rotated 90º counterclockwise from horizontal
2	Rotated 180º counterclockwise from horizontal
3	Rotated 270º counterclockwise from horizontal

Height Magnification of Bar, Box, or UDC, Define

Purpose

Defines the character height magnification of a box, barcode, or user–defined character. Defines the vertical magnification of the character bitmap for human–readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

h*n*

Parameters

n

Height magnification (in dots) of a box, barcode, or user-defined character.

Vertical magnification of the character bitmap for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Box	1 to 9999 dots	100
Barcode	1 to 9999 dots	50
User–defined Character	1 to 999 dots	1
Graphics	1 to 250	1
Human–readable	1 to 250	2
POSTNET	1 to 250	2

Note: *If you set n to a number that is too large, the printer uses the highest value it can support.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Interpretive Field, Enable or Disable

Purpose

Determines if the interpretive field of the current barcode field prints.

Supported Printers

All

Syntax

i*n*

Parameters

n

Enables or disables printing of the interpretive field. For all printers:

n	Description
0	Disable printing
1	Enable printing with start and stop characters
2	Enable printing without start or stop characters

Note: *When you enable the interpretive field, the human-readable information in the default font (font 0, 7 x 9 standard) prints 2 dots below the barcode field and is left justified.*

Use Interpretive Field, Edit to edit an interpretive field.

If ECI support is enabled (for Aztec and DataMatrix symbologies), the interpretive field is printed without the ECI-related characters. For example, the string "\000009abc\\123" is printed as "abc\123".

Field Origin, Define

Purpose

Defines the origin for a field. The field origin is the upper left corner of the field. Horizontal *n* and vertical *m* locations represent the number of dots from the label's origin (0,0 – the upper left square on the label).

Supported Printers

All

Syntax

o*n,m*

Parameters

n

Horizontal number of dots from the label origin.

Range: 0 to 19999

Default: 0

m

Vertical number of dots from the label origin.

Range: 0 to 19999

Default: 0

Character Rotation or Barcode Ratio, Define

Purpose

Defines the character rotation for human-readable fields or the barcode ratio for a barcode field.

Supported Printers

All

Syntax

r*n*

Parameters

n

Defines the character rotation or barcode ratio.

Values for *n*:

Field Type	Values	Default
Barcode	0: 2.5 to 1 1: 3.0 to 1 2: 2.0 to 1 3: 2.3 to 1	1
Human-readable	0: horizontal 1: 90° counterclockwise	0

Note: *If the barcode width is odd and you select r0, the printer substitutes r1. The narrow elements of this code are always at least 3 dots. To have the shortest symbol, select a width of w = 1.*

Note: *Control characters for bitmap fonts c0, c1, c2, and c7 cannot be printed in rotated orientation.*

Width of Line, Box, Bar, or Character, Define

Purpose

Defines the width magnification of a line, box, barcode, or character. Defines the character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

w*n*

Parameters

n

Width magnification (in dots) of a line, box, barcode, or character. Character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Line	1 to 9999 dots	1
Box	1 to 9999 dots	1
Barcode	1 to 99 dots	1
Character	1 to 999 dots	2
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *For Aztec, DataMatrix, and QR Code barcodes, the default value for n is 3.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Barcode, Select Type: Code 2 of 5

Syntax

c3[,*m*]

Parameters

m

Modifier for Code 2 of 5:

m	Modifier
0	3-bar start/stop mode (default)
1	2-bar start/stop mode.

Barcode, Select Type: ISBT 128

Syntax

c24[,*m1*][,*m2*][,*m3*][,*m4*]

Parameters

m1

Modifier for ISBT 128:

m1	Description
0	Do not print flag character.
1 (default)	Print flag character. Data comes from the host.

Flag character printing only applies to Donation Identification Number (DIN) data structure.
If the flag characters value is set between 60 and 96, the printer will consider it as type 3 and will calculate the new value by adding 60 to the value of the check character for the flag characters automatically. It will not be printed as part of the human-readable text of the DIN.

m2

Modifier for ISBT 128. This parameter determines the processing of spaces and vertical bars in the barcode data:

m2	Description
0	The barcode will not include any space or vertical bars. The space will be printed in the human-readable field, but the vertical bar (|) will not. (default)
non-zero	The barcode will contain all data in the input string except for a vertical bar.

m3

Modifier for ISBT 128. This parameter sets the human readable text scaling:

m3	Description
0	No scaling.
1	Increase the font size magnification by 1 for the numbers following the vertical bar character. These numbers are the serial number of the printer. (default)
N	Increase the font size magnification by N for the numbers following the vertical bar character. These numbers are the serial number of the printer.

m4

Modifier for ISBT 128. This parameter determines if the printer calculates and prints the keyboard check character:

m4	Description
0	Disabled. The keyboard check character is not printed.
1	Enabled. The printer calculates the keyboard check character and prints it. (default)

Barcode, Select Type: Codabar

Syntax

c4[,*m*]

Parameters

m

Modifier for Codabar:

m	Modifier
0	Host enters start/stop codes and printer verifies (default)
1,x,y	Printer enters start code *x* and stop code *y*. The values for *x* and *y* can range from A to D and from a to d.

Note: *Valid start/stop characters range from A to D and from a to d. You can define them as part of the barcode field, or you can download them as part of the print data. Start/stop characters sent down with printer data override the characters defined by the barcode field.*

Barcode, Select Type: Interleaved 2 of 5

Syntax

c2[,*m*]

Parameters

m

Selects barcode version:

m	Version
0	No check digit (default)
1	Printer enters check digit.
2	Host enters check digit.

Note: *The printer adds a zero to character strings that are odd in length.*

Barcode, Select Type: EAN/UPC

Syntax

c7[,*m1*][,*m2*]

Parameters

m1

Selects options for EAN/UPC:

m1	Options
0	Printer enters check digit. Flag 1 enabled. (default)
1	Printer enters check digit. Flag 1 disabled.
2	Host enters check digit and printer verifies Flag 1 enabled.
3	Host enters check digit and printer verifies. Flag 1 disabled.

m2

Selects barcode length based on type:

m2	Barcode Length
0	Variable length (default)
1	EAN 8
2	EAN 13
3	UPC Version A
4	UPC Version E
5	UPC Version D1
6	UPC Version D2
7	UPC Version D3
8	UPC Version D4
9	UPC Version D5

Note: The variable length option selects the EAN/UPC version by the number of characters in the data field. The number of data characters and check characters allowed for each version are:

Type	Number of Data and Check Characters
EAN 8	Variable length (default)
EAN 13	07 data + 1 check character
UPC version A	12 data + 1 check character
UPC version E	11 data + 1 check character
UPC version D1	06 data + 1 check character
UPC version D2	13 data + 1 check character
UPC version D3	18 data + 2 check characters
UPC version D4	22 data + 2 check characters
UPC version D5	25 data + 3 check characters

Use a . (period) to delimit the barcode data from the supplemental data. Data to the right of the . is supplemental data; data to the left is barcode data. You can add the two- or five-digit supplemental to any version of the EAN/UPC code.

The flag 1 option only applies to EAN 8, EAN 13, and UPC version A. For EAN 13, enabling the flag 1 option prints the first character of the barcode interpretive. For EAN 8 and UPC version A, enabling the flag 1 option moves the first and last character of the barcode interpretive outside of the guard bars.

Barcode, Select Type: DataMatrix

Honeywell printers support two versions of DataMatrix: ECC-100 and ECC-200. Use ECC-200 for new applications.

DataMatrix is a 2D matrix symbology made up of square modules arranged within a perimeter finder pattern. The finder pattern is a perimeter to the data region and is one module wide. Two adjacent sides are solid dark lines. These lines are used to define physical size, orientation, and symbol distortion.

Syntax

c17[,*m1*][,*m2*][,*m3*,*m4*[,*m5*,*m6*]],[*m7*]

Parameters

m1

Three-digit number that sets the DataMatrix version:

m1	Version
100	ECC-100
200	ECC-200 (Default)

m2

Determines if the symbol is square or rectangular:

m2	Symbol
0	Square (default)
1	Rectangular

The amount of data you enter determines the size of the symbol.

m3

Position of the current symbol in the group. Use when defining Structured Append symbols in ECC-200. If you do not set *m3* or if you set it to 0, you disable Structured Append mode.

Range: 0 to 16

Default: 0

m4

Total number of symbols in the group. Use when defining Structured Append symbols in ECC-200.

Range: 0 to 16

Default: Current value for *m3*

m5

File identifier. Use when defining Structured Append symbols in ECC-200.

Range: 1 to 254

Default: 1

m6

File identifier. Use when defining Structured Append symbols in ECC-200.

Range: 1 to 254

Default: 1

m7

Enables or disables ECI support:

m7	Description
0	ECI support disabled (default)
1	ECI support enabled

When ECI support is enabled, the string "\<*nnnnnn*>" is interpreted as a command to change the character set, where *nnnnnn* is the character set to be used. This string is decoded as an ECI character, plus a 1- to 3-character codeword in the barcode. All ECI characters are printed in ASCII, so the current encoding mode does not matter. Other characters are printed in the most efficient mode.

Also, the string "\\" is printed as "\" in the most efficient mode and is decoded as if ECI is disabled.

If the barcode data does not fit the rules as specified, error 11 occurs.

Note: *As an example in Structured Append mode, setting m3, m4, m5, m6 to 2, 5, 1, 43 indicates that the current symbol definition is the second in a group of 5 with the file identifier of 1, 43.*

This table lists the number of numeric, alpha, or 8-bit characters you can place in a DataMatrix barcode for each version:

Type of Character	ECC-100	ECC-200
All numeric	88	3116
All alpha	59	2335
All 8-bit	38	1556

Barcode, Select Type: GS1 Composite

GS1 Composite (formerly called UCC/EAN-128) uses the same code set as Code 128/GS1-128, except it does not allow function codes FNC2 through FNC4. FNC1 can be sent to the printer as the data string <SUB><SUB>1.

Syntax

c21[,*m1*][,*m2*][,*m3*][,*m4*][,*m5*][,*m6*]

Parameters

m1

Sets the symbology version:

m1	Version
0	UCC/EAN-128 with CC-C (default)
1	UCC/EAN-128 with CC-A or CC-B
2	EAN-13 with CC-A or CC-B
3	EAN-8 with CC-A or CC-B
4	UPC-A with CC-A or CC-B
5	UPC-E with CC-A or CC-B
6	GS1 Composite with CC-A or CC-B
7	GS1 Composite Truncated with CC-A or CC-B
8	GS1 Composite Stacked with CC-A or CC-B
9	GS1 Composite Stacked Omnidirectional with CC-A or CC-B
10	GS1 DataBar Limited with CC-A or CC-B
11	GS1 DataBar Expanded with CC-A or CC-B
12	GS1 DataBar Expanded Stacked with CC-A or CC-B

The printer determines whether CC-A or CC-B will be used based on the amount of data sent to the 2D Composite Component.

m2

Height of the separator pattern row. Valid only when *m1* is set to 0 or from 6 to 12.

If the value for *m2* is set too low, the height is changed to the smallest allowed value for the selected magnification.

If the value for *m2* is set too high, an "invalid barcode data" error occurs.

Range: Between 1 time and 2 times the value set by Width of Line, Box, Bar, or Character Define. For example, if the width is set to 3, the range for *m2* is 3 to 6.

Default: 1

m3

Number of columns per row (or the number of segments per row if *m1* = 12).

Setting *m1* and *m3* to 0 selects the largest number of columns for the 2D barcode to fit within the 1D barcode (including its quiet zones).

Range: 1 to 30

Default: 0 if *m1* = 0, or 4 if *m1* = 12

m4

Enables display of space and parentheses ("(," ")") characters:

m4	Description
0	Barcode does not include space or parentheses characters in the data, but displays these characters in the human readable interpretive field.
1	Barcode and human readable interpretive field include the space and parentheses characters.

m5

Height of each row in the 2D barcode.

Default: 0 (height is 3 times the magnification value).

m6

Enables printing of the human readable interpretive field:

m6	Description
0	Human readable interpretive field is not printed
1	Human readable interpretive field is printed

The human readable interpretive field for the 2D Composite Component is displayed if Interpretive Field, Enable or Disable is set to 1.

Note: *The GS1 Composite symbology consists of an GS-128 linear component associated with an adjacent 2D Composite Component. The linear component encodes the primary identification so that it is readable by all scanning technologies and so that 2D imagers can use the linear component as a finder pattern for the adjacent 2D Composite Component. The linear components include these barcodes:*

- *UCC/EAN-128*

- *UPC-A*
- *EAN-8*
- *EAN-13*
- *GS1 DataBar family*

The 2D Composite Component encodes supplementary data, such as batch number or expiration date. There are three types of 2D Composite Components that are all based on the PDF417 symbology:

- CC-A is a structural variant of MicroPDF417.
- CC-B is a MicroPDF417 symbol.
- CC-C is a PDF417 symbol.

2D Composite Components encode characters from the ISO 646 code set.

The data for the linear and 2D components is separated by the <HT> command with the data for the linear component sent first. For example, to print a Composite barcode with the linear component encoding 112233445566 and the 2D component encoding aabbccddeeff, the data is sent to the printer as 112233445566<HT>aabbccddeeff.

This table lists all possible combinations of linear and 2D Composite components:

Linear Component		2D Composite Component Maximum Data Length		
Barcode Type	Data Length	CC-A	CC-B	CC-C
GS-128	1–48 digits	56 digits 31 char	338 digits 196 char	2361 digits
EAN-13	13 digits	56 digits 31 char	338 digits 196 char	Not available
EAN-8	8 digits	47 digits 26 char	219 digits 127 char	Not available

Linear Component		2D Composite Component Maximum Data Length		
Barcode Type	Data Length	CC-A	CC-B	CC-C
UPC-A	12 digits	56 digits 31 char	338 digits 196 char	Not available
UPC-E	8 digits	47 digits 26 char	96 digits 55 char	Not available
GS1 Composite, GS1 Composite Truncated	1-13 digits	56 digits 31 char	338 digits 196 char	Not available
GS1 Composite Stacked, GS1 Composite Stacked Omnidirectional	1-13 digits	47 digits 26 char	96 digits 55 char	Not available
GS1 DataBar Limited	1-13 digits	47 digits 26 char	219 digits 127 char	Not available
GS1 DataBar Expanded, GS1 DataBar Expanded Stacked	1-74 digits* 1-41 char*	56 digits 31 char	338 digits 196 char	Not available

Data lengths with an asterisk (*) indicate that the actual maximum amount of data depends on data content.

See Also ISO 646 Subset Characters

Barcode, Select Type: HIBC Code 39

Syntax

c8[,*m1*][,*m2*]

Parameters

m1

Sets format for HIBC Code 39.

Values for *m1* that conform to the supplier standard:

m1	Format
0	Selects HIBC Code 39, primary format (default).
1	Selects HIBC Code 39, alternate primary format.
2	Selects HIBC Code 39, secondary format. If you set *m1* to 2, you need to specify *m2*.

Values for *m1* that conform to the provider standard:

m1	Format
3	Single format.
4	First data format.
5	Selects HIBC Code 39, second data format. If you set *m1* to 5, you need to specify *m2*.
6	Selects HIBC Code 39, multiple data format.

m2

Field identifier.

Barcode, Select Type: JIS-ITF

Syntax

c15[,*m*]

Parameters

m

Selects a magnification level:

m	Magnification Level
0	Selects 5 dot narrow bar width magnification (default).
1	Selects 8 dot narrow bar width magnification.
2	Selects 10 dot narrow bar width magnification.

Note: *Valid narrow bar width magnifications are 5, 8, and 10 dots. Due to printhead dot size limitations, the printer cannot achieve a true 2.5 to 1 ratio when using a narrow bar width of 5 dots. The printer uses a wide bar width of 12 dots for a true 2.4 to 1 ratio instead.*

Using the Field Data, Define Source Command

JIS-ITF barcode fields consist of these three categories: standard, condensed, and enlarged. If you are not using the command to define the source of the field data, the printer automatically selects a category. If your barcode field contains 14 characters, the printer uses standard JIS-ITF. If your field contains 6, the printer uses the condensed version, and if your field contains 16, the printer uses the enlarged version.

Use the Field Data, Define Source command for JIS-ITF:

d[*n*][,*m*]

defined as:

n	Description
d0 [, *m*]	This field receives data from a host. *m* is the data length, which can be set to 6 (condensed), 14 (standard), and 16 (extended).

n	Description
d2 [, *m*]	This field acts as a slave field and receives its data from another field (master slave). *m* is the master slave field ID.
d3 [, *m*]	The printer defines the data during Program mode (fixed). *m* determines the JIS–ITF type. If the data length is not exactly 6, 14, or 16, the printer uses the next highest JIS-ITF type with zero padding in front.

Default for *n,m*: 0,14

Barcode, Select Type: MaxiCode

MaxiCode is a fixed-size 2D symbology where the printer ignores height and width magnification. This symbology is made up of offset rows of hexagonal elements, each of which is 35 mils wide by 40 mils high, arranged around a bulls-eye finder pattern. Each hexagon represents one bit of information and is either black or white depending on the state of the encoded data bit. United Parcel Service (UPS) developed MaxiCode for the specific purpose of encoding information about a parcel.

Syntax

c14[,*m*]

Parameters

m

Sets options for MaxiCode:

m	Options
2	Structured Carrier Message for numeric postal codes up to 9 digits.
3	Structured Carrier Message for alphanumeric postal codes up to 6 characters.
4	Standard Symbol.
5	Full Enhanced Error Correction (EEC).
6	Reader Programming.

The default value automatically discriminates between Modes 2, 3, and 4. If you developed previous applications using Mode 0, your printer will still support your application; however, Honeywell recommends using Mode 2 or 3 for new applications.

Note: *When you select MaxiCode, you must format your data to conform to the five fields described in the next table. Note that the optional header only applies if m is set to 2 or 3 (Structured Carrier Message).*

$[)>^R{}_S01^G{}_S97982039280^G{}_S840^G{}_S001^G{}_Sup\_to\_84-character\_message^E{}_T$

Field	Description of Field	Number of Characters	Default
1	Header (Optional. Valid only if *m* is set to 2 or 3)	Nine	None

Field	Description of Field	Number of Characters	Default
2	Postal code	Six or nine	None
3	Country code	Three	840 (U.S.A.)
4	Service class	Three	999
5	Secondary Message	84	None

The NULL character is not supported. If the NULL character appears in the user data, you will lose it along with any following data.

All control characters (<RS>, <GS>, <EOT>, etc.) must be preceded by a <SUB> character, as illustrated in the next examples.

Example

This example illustrates the command for MaxiCode Mode 2:

```
<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E1;F1<ETX>
<STX>H0;o10,10<ETX>
<STX>B1;o100,300;f1;c14,2;h6;w6;d0,100<ETX>
<STX>R<ETX>
<STX><ESC>E1<CAN><ETX>
<STX>MaxiCode Sample Mode 2<CR><ETX>
<STX>[><SUB><RS>01<SUB><GS>01982039280<SUB><GS>840<SUB><GS>001<SUB>
<GS>1Z94924221455215<SUB><RS>Honeywell 6001 36th Ave West Everett,
WA 98203
<SUB><EOT><ETX>
<STX><ETB><ETX>
```

This example illustrates the command for MaxiCode Mode 3:

```
<STX><ESC>P<ETX>
<STX>E1;F1<ETX><STX>H0;o10,10<ETX>
<STX>B1;o100,300;f1;c14,3;h6;w6;d0,100<ETX>
<STX>R<ETX>
<STX><ESC>E1<CAN><ETX>
<STX>MaxiCode Sample Mode 3<CR><ETX>
<STX>[)><SUB><RS>01<SUB><GS>96T51654<SUB><GS>484<SUB>
<GS>066<SUB><GS>1Z00000256<SUB><RS><SUB><EOT><ETX>
<STX><ETB><ETX>
```

Barcode, Select Type: Aztec

Syntax

c23[,*m1*][,*m2*][,*m3*][,*m4*]

Parameters

m1

Sets Aztec-specific options:

m1	Description
0	23%+3 codewords (default). Dynamic symbol size with fixed error correction.
1 to 99	Static error correction level in percent. Dynamic symbol size.
101 to 104	Compact Format symbol, 1 to 4 layers (+100). Static symbol size. Error correction level depends on spare bits in chosen symbol size.
201 to 232	Full range symbol. 1 to 32 layers (+200). Static symbol size. Error correction level depends on spare bits in chosen symbol size.
300	Simple Aztec "rune."

m2

Enables or disables menu symbol:

m2	Description
0	Menu symbol off (default)
1	Menu symbol on

m3

Enables or disables symbol append:

m3	Description
1	Symbol append off (default). ID field used if present.
2 to 26	Append # of symbols. ID field used if present.

m4

Enable or disable ECI:

m4	Description
0	ECI off (default)
1	ECI on

When ECI support is enabled, the string "\<*nnnnnn*>" is interpreted as a command to change the character set, where *nnnnnn* is the character set to be used. This string is decoded as an ECI character, plus a 1- to 3-character codeword in the barcode. All ECI characters are printed in ASCII, so the current encoding mode does not matter. Other characters are printed in the most efficient mode.

Also, the string "\\" is printed as "\" in the most efficient mode and is decoded as if ECI is disabled.

If the barcode data does not fit the rules as specified, error 11 occurs.

Barcode, Select Type: Code 11

Syntax

c5[,*m*]

Parameters

m

Modifier for Code 11:

m	Modifier
0	Printer enters 2 check digits (default)
1	Printer enters 1 check digit
2	Host enters 2 check digits and printer verifies
3	Host enters 1 check digit and printer verifies

Barcode, Select Type: Code 16K

Syntax

c9

There are no modifiers for Code 16K.

Note: *In Emulation mode, use a <SUB> 1 to represent the function 1 character. To represent the function 1 character in Advanced mode, enter <SUB><SUB> 1. Represent the characters for functions 2, 3, and 4 in the same way.*

Note: *To produce a square symbol, specify a height magnification of 1 in Advanced mode. To specify a square symbol, use a height magnification of 250 in Emulation mode.*

Barcode, Select Type: Code 39

Syntax

cO[,*m*]

Parameters

m

Modifier for Code 39:

m	Description
0	Selects 8646 compatible Code 39. No check digit. (default)
1	Selects 8646 compatible Code 39. Printer enters check digit.
2	Selects 8646 compatible Code 39. Host enters check digit and printer verifies.
3	Selects full ASCII Code 39. No check digit.
4	Selects full ASCII Code 39. Printer enters check digit.
5	Selects full ASCII Code 39. Host enters check digit and printer verifies.
6	Selects 43 character Code 39. No check digit.
7	Selects 43 character Code 39. Printer enters check digit.
8	Selects 43 character Code 39. Host enters check digit and printer verifies.

Note: *Honeywell printers support three different types of Code 39:*

- 43 character Code 39
- Full ASCII Code 39
- 8646 compatible Code 39 (except the EasyCoder F4, PF2i, PF4i and PM4i)

The 8646 compatible version only differs from the full ASCII version by four characters. The $, %, /, and + are encoded as single characters instead of as /D, /E, /O, and /K. The 8646 compatible version allows the printer to be backward compatible with 86XX printers.

When you enter <ESC><SPACE> as data, the printer prints the start and stop characters.

Barcode, Select Type: Code 49

Syntax

c10

There are no modifiers for Code 49.

Note: *Use a <SUB> 1 to represent the function 1 character in Emulation mode. In Advanced mode, you can represent the function 1 character by entering <SUB><SUB> 1. You can represent the characters for functions 2, 3, and 4 in the same way.*

Note: *To produce a square symbol, specify a height magnification of 1 in Advanced mode. To specify a square symbol, use a height magnification of 250 in Emulation mode.*

Note: *The printer supports only the alphanumeric (0) and numeric (2) modes.*

Barcode, Select Type: Code 93

Syntax

c1

There are no modifiers for Code 93.

Barcode, Select Type: Code 128/GS1-128

Syntax

c6[,*m1*][,*m2*][,*m3*]

Parameters

m1, *m2*

Modifiers for Code 128/GS1-128. Both modifiers are always present:

m1, *m2*	Description
0,0	Selects Code 128, keep parentheses and spaces. (default)
0,1	Selects Code 128, ignore parentheses and spaces in the barcode but keep them in the interpretive field.
1,0	Selects UCC-128 Serial Shipping Container Code.
1,1	Selects UCC-128 Serial Shipping Container Code and keep parentheses and spaces in interpretive field.

In Emulation mode, you can print the Function 1 character by entering <SUB> 1. In Advanced mode, you can print the Function 1 character by entering <SUB><SUB> 1. You can print the characters for Function 2, 3, and 4 in the same way.
UCC-128 serial shipping container code automatically starts in subset C with a <FNC1>. It is a fixed length version of Code 128 requiring you to enter 19 numeric characters. The printer forces the first two characters to zero.

m3

Modifier for Code 128/GS1-128:

m3	Description
0	Automatically selects character subset. Honeywell recommends that you set *m3* to 0 unless you are familiar with Code 128 subsets. The printer will automatically determine the correct start subset and perform any necessary switching between subsets. (default)
1	Starts in subset A.
2	Starts in subset B.
3	Starts in subset C.

Note: *m3 is valid only in the EasyCoder PF4i and PM4i printers with firmware version 2.10 and higher, and m1 must equal 0. If you set m3 to a number other than 0, only*

characters within the chosen subset are valid. If you enter characters from another subset, the printer generates an error code 11 (invalid barcode data) and the barcode will not print.

Note: *To switch to another character subset within the barcode (if m3 = 1, 2, or 3), enter:*

<SUB><SUB>n

where n is A, B, or C depending on if you want to switch to subset A, B, or C.

Or,

where n is S and the current subset is A or B. The next single character is shifted from the current subset into the other subset (A or B). Then, the following characters return to the current subset. If you set n equal to S and the current subset is C, this command is ignored.

Barcode, Select Type: GS1 DataBar

The GS1 DataBar family (formerly RSS) contains seven different linear barcodes that can be used individually or as Composite Components for the GS1-128 symbology. See the Notes for more information on the differences between GS1 DataBar barcode types.

Syntax

c20[,*m1*][,*m2*][,*m3*]

Parameters

m1

Selects the RSS version:

m1	Version
0	GS1 DataBar
1	GS1 DataBar Truncated
2	GS1 DataBar Stacked (default)
3	GS1 DataBar Stacked Omnidirectional
4	GS1 DataBar Limited
5	GS1 DataBar Expanded
6	GS1 DataBar Expanded Stacked

m2

Height of the separator pattern row. Valid only when *m1* = 2, 3, or 6.

Minimum is 1X the defined bar magnification of the barcode (set by the Width of Line, Box, Bar, or Character, Define command). If *m2* is set too low, the height is changed to the smallest legal value for the selected magnification.

Default: 1

m3

Number of segments per row. Valid only when *m1* = 6.

Range: even numbers from 2 to 22

Default: 2

This table describes the seven GS1 DataBar barcode types.

RSS Barcode	Description
GS1 DataBar	Numeric only linear symbology used to encode the Global Trade Item Numbers (GTINs) for scanning in the supply chain. RSS-14 is smaller than EAN-13 or UPC-A and may include up to 13 digits.The check digit is not included in the data.
GS1 DataBar Truncated	Reduced height symbology designed to fit on small, narrow items. This barcode may include up to 13 digits.The check digit is not included in the data.
GS1 DataBar Stacked	A variation that is stacked in two rows, and is suitable for applications with limited width available. This barcode may include up to 13 digits.The check digit is not included in the data.
GS1 DataBar Stacked Omni-directional	Full height version symbology with omni directional scanning capability so it can be scanned at retail point-of-sale. This barcode may include up to 13 digits.The check digit is not included in the data.
GS1 DataBar Limited	Numeric only linear symbology used to encode the Global Trade Item Numbers (GTINs) for scanning in the supply chain. This barcode may include up to 13 digits.The check digit is not included in the data.
GS1 DataBar Expanded	Encodes a maximum of 74 numeric or 41 alphanumeric characters from a subset of ISO 646 consisting of the uppercase and lowercase letters, digits, 20 selected punctuation characters and the FNC1 character.
GS1 DataBar Expanded Stacked	RSS-14 Expanded symbology that is stacked in 2 to 11 rows.

The height of the barcodes or the height of each row in the stacked barcodes is determined by the [Height Magnification of Bar, Box, or UDC, Define](#) command. For GS1 DataBar Stacked, the lower row is set using the value specified in the bar height magnification command and the upper row height is calculated from this value. If the bar height magnification command is not sent, the barcode defaults to the proper height specified for the selected width:

- For m1 = 0 h[n] = 33*w[n]
- For m1 = 1 h[n] = 13*w[n]
- For m1 = 2 h[n] = 7*w[n]
- For m1 = 3 h[n] = 33*w[n]
- For m1 = 4 h[n] = 10*w[n]
- For m1 = 5 h[n] = 33*w[n]
- For m1 = 6 h[n] = 34*w[n]

If the amount of data sent to the barcode exceeds the defined limit, error code (02) is generated and the barcode does not print. Error code (11) (Invalid barcode data) is generated if not all characters are valid for the selected barcode type.

See Also

Interpreting Error Codes and Solving Problems

ISO 646 Subset Characters

Barcode, Select Type: HIBC Code 128

Syntax

c16[,*m1*][,*m2*]

Parameters

m1

Sets format for HIBC Code 128.

Values for *m1* that conform to the supplier standard:

m1	Format
0	Selects HIBC Code 128, primary format (default).
1	Selects HIBC Code 128, alternate primary format.
2	Selects HIBC Code 128, secondary format. If you set *m1* to 2, you need to spe–cify *m2*.

Values for *m1* that conform to the provider standard:

m1	Format
3	Single format.
4	First data format.
5	Selects HIBC Code 128, second data format. If you set *m1* to 5, you need to spe–cify *m2*.
6	Selects HIBC Code 128, multiple data format.

m2

Field identifier.

Barcode, Select Type: MicroPDF417

MicroPDF417 is a 2D symbology derived from PDF417. Use MicroPDF417 for applications that need improved area efficiency but do not require PDF417's maximum data capacity.

MicroPDF417 replaces PDF417's 17-module-wide start/stop patterns and left/right row indicators with a unique set of 10-module-wide Row Address Patterns, designed to reduce overall symbol width and enable linear scanning at row heights as low as 2X. MicroPDF417, unlike PDF417, may only be printed in certain defined combinations of number of data columns and number of data rows, up to a maximum of 4 data columns by 44 data rows.

Syntax

c19[,*m1*][,*m2*]

Parameters

m1

Sets the number of data columns in the printed symbol. The default setting (0) allows the printer to determine the most efficient size for given data.

Range: 0 to 4

Default: 0

m2

Sets the number of data rows in the printed symbol. The default setting (0) allows the printer to determine the most efficient size for given data.

Range: Depends on the setting for *m1*

Default: 0

Note: *MicroPDF417 uses these symbol sizes (data columns x data rows), each with a distinct error correction capacity:*

1x11	2x8	3x6	4x4
1x14	2x11	3x8	4x6
1x17	2x14	3x10	4x8
1x20	2x17	3x12	4x10
1x24	2x20	3x15	4x12
1x28	2x23	3x20	4x15
	2x26	3x26	4x20

		3x32	4x26
		3x38	4x32
		3x44	4x38
			4x44

Barcode, Select Type: PDF417

PDF417 is a stacked 2D symbology that provides the ability to scan across rows of code. Each row consists of start/stop characters, row identifiers, and symbol characters, which consist of four bars and four spaces each and contain the actual data. This symbology uses error correction symbol characters appended at the end to recover loss of data.

Syntax

c12[[,*m1*][,*m2*][,*m3*]];

Parameters

m1

Number of columns of data characters.

If you set *m1* to 0 (default), the printer determines the number of columns needed to create a symbol that is as close to a square as possible.

When you select 0, the printer selects a height magnification that is three times the width magnification. The specifications of PDF417 recommend these magnification values for creating a symbol that you can scan easily.

Range: 0 to 30

Default: 0

m2

Level of error correction. Each level provides a certain number of detection characters, which can detect and recover a specific number of faulty characters.

Range: 0 to 9

Default: 9 (allows the printer to automatically select the appropriate level based on the amount of data)

The level of error correction that works best for your data depends on the amount of characters in your symbols. If you decide to select your own error correction level, you need to estimate the number of characters, because they are formed by compressing the raw data you send to the printer. In general, 1.8 alphanumeric characters generate one symbol character. If you are using numeric data, 2.9 digits generate one data symbol character.

Honeywell recommends that you leave the error correction level at the default setting of 9. This setting lets the printer select a level, between level 2 and level 5, that provides the most efficient error correction of your data. The printer bases the level selection on the number of symbol characters your data generates.

This table lists values for *m2*, the recommended data amount that you should use for each value, and the number of error correction characters that it generates.

m2	Recommended Amount of Data	Error Detection Characters	Notes
0		2 (error detected, no recovery)	Use this value only if your labels do not have enough space for more error correction characters. Usually, these values are not recommended.
1		4	Use this value only if your labels do not have enough space for more error correction characters. Usually, these values are not recommended.
2	1 – 40	8	
3	41 – 160	16	
4	161 – 320	32	
5	321 – 863	61	
6		128	Reserved for special applications where the symbol is subject to damage and requires a higher level of error correction.
7		256	Reserved for special applications where the symbol is subject to damage and requires a higher level of error correction.
8		512	Reserved for special applications where the symbol is subject to damage and requires a higher level of error correction.
9			*m2* = 9 lets the printer set *m2* to the recommended value for each symbol based on the number of characters. An *m2* value of 9 is the default setting.

m3

Indicates whether to print the symbol in truncated form:

m3	Description
0	Disable truncation (default)
1	Enable truncation

If truncated, the symbols print without right row indicators and with only a one-module wide stop character. To minimize errors and maintain the best reading performance, Honeywell recommends that you leave *m3* equal to 0.

Note: *This table shows the approximate data capacity (maximum number of characters allowed) for the three character sets. 2D symbols encode data by compressing it in different amounts, so use these values as guidelines. The exact data capacity varies with the actual data being encoded.*

Character Set	Data Capacity
Full ASCII	1108
Alphanumeric	1850
Numeric	2725

Barcode, Select Type: Planet

Planet is a linear barcode similar to the POSTNET barcode. Planet barcodes print at a fixed size so any height and width commands are ignored.

Syntax

c22

There are no modifiers available for Planet.

Barcode, Select Type: POSTNET

POSTNET uses the height (h) and width (w) commands in the same way as a font. Other symbologies use h to specify the bar height and w to specify the narrow bar width. POSTNET uses h and w to magnify the base character cell. Each character cell is 13 dots high by 22 dots wide. The default width and height magnification for POSTNET is 2 x 2, resulting in a symbology sized according to the POSTNET specification.

Syntax

c11

There are no modifiers available for POSTNET.

Barcode, Select Type: QR Code

QR Code is a matrix 2D symbology that encodes data into patterns consisting of black and white dots or modules. A three position detection pattern enables omnidirectional reading and ultra high–speed reading. QR Code can handle a wide range of data, including numerical, alphabetical, Kanji, Hiragana, Katakana, graphics, and control codes. A built–in error correction function enables the QR Code to repair errors in the code.

Syntax

c18[,*m1*][,*m2*][,*m3*]

Parameters

m1

Sets the QR model:

m1	Model
1	Model 1
2	Model 2 (default)

m2

Sets the error correction level:

m2	Error correction level
L	7% correction
M	15% correction (default)
Q	25% correction
H	30% correction

m3

Sets the mask number:

m3	Version
0 to 7	Mask type
8	Auto–selection of mask by printer (default)

Note: *You can only create QR symbols up to 3550 characters.*

Barcode, Select Type: USPS4CB

Syntax

c25

There are no modifiers for USPS4CB.

Bitmap User-Defined Font Editing Commands

Syntax	Command Name
t	User-Defined Font Character, Create
u	Graphic or UDC, Define
X	Character Bitmap Origin Offset, Define
x	Bitmap Cell Width for Graphic or UDF, Define
y	Bitmap Cell Height for Graphic or UDF, Define
Z	Font Character Width, Define
z	Intercharacter Space for UDF, Define

Bitmap Cell Height for Graphic or UDF, Define

Purpose

Defines the height of a graphic or user-defined font.

Supported Printers

All

Syntax

y*n*

Parameters

n

Height of the graphic or user-defined font. For a bitmap font or graphic, *n* is the number of rows. For outline fonts, *n* is the height of the base character in dots.

Range: 1 to 799

Default:

Type	Default for *n*
Bitmap fonts	1
Outline fonts	10
Graphics	50

Note: *All printers generate an* error code (52) *for an invalid height value.*

Bitmap Cell Width for Graphic or UDF, Define

Purpose

Defines the maximum width for a graphic or any character in a font. Each character has a width within this amount, which should be at least as wide as the widest character in the font.

Supported Printers

All

Syntax

x*n*

Parameters

n

Number of columns for the UDC, bitmap, or user–defined font.

Range: 1 to 799

Default: 1

Note: *All printers generate an* [error code (52)](#) *for an invalid width.*

Character Bitmap Origin Offset, Define

Purpose

Defines the offset, to the right, of all characters in a font. If you define each character's width in columns, with the first column numbered 0, the origin of each character is at the column with the same number as n. For example, $n = 2$ shifts the character origins two columns to the right.

Use this command only with bitmap fonts.

Supported Printers

All

Syntax

Xn

Parameters

n

Number of columns to offset the characters to the right.

Range: 0 to 800

Default: 0

Font Character Width, Define

Purpose

Defines the amount of space from the origin of one letter to the origin of the next. If n is too small, characters may overlap.

Supported Printers

All

Syntax

Zn

For all printers, the default value is the character's bitmap width, minus the font character offset (Xn) plus the intercharacter space ($z n$).

Parameters

n

Amount of space from the origin of one letter to the origin of the next.

Range: 1 to 799

Note: *This command is for bitmap characters only. The printer ignores the intercharacter space command (zn) if you use it with this command.*

Graphic or UDC, Define

Purpose

Maps one column of bitmap for a graphic or a font character. *n* is the column to be mapped.

Supported Printers

All

Syntax

u*n,m...m*

Parameters

n

Number of the column to be mapped.

Range: 1 to 799

m...m

Advanced mode: Data byte representing 6 bits of the bitmap.

Emulation mode: A string of 1s and 0s that make up the column and specify whether to print in that row element of the column:

m	Description
0	Do not print in the row element.
1	Print in the row element.

Unmapped columns or row elements default to 0.

Intercharacter Space for UDF, Define

Purpose

Defines the amount of space added to the default intercharacter gap length for a bitmap font. The number of dots you select for *n* define the intercharacter gap length.

Supported Printers

All

Syntax

zn

Parameters

n

Amount of space to add in dots.

Range: 0 to 199

Default: 2

Note: *The printer ignores this command if you use it with the* Font Character Width, Define *command.*

The printer generates an error code (52) for invalid lengths.

The unit for *n* is in number of dots per pixels. In Advanced Mode, a dot is:

- 5 mil for a 200 (or 300) dpi printer.
- 2.5 mil for a 400 dpi printer.

User-Defined Font Character, Create

Purpose

Specifies which font character you will define next.

Supported Printers

All

Syntax

t*n*

Parameters

n

Decimal representation of the ASCII character. The printer erases existing characters.

Range: 0 to 255

Program Mode: Box Field Editing Commands

Syntax	Command Name
f	Field Direction, Define
h	Height Magnification of Bar, Box, or UDC, Define
l	Length of Line or Box Field, Define
o	Field Origin, Define
w	Width of Line, Box, Bar, or Character, Define

Field Direction, Define

Purpose

Defines the field rotation.

Supported Printers

All

Syntax

f*n*

Parameters

n

Defines the field direction:

n	Field Direction
0	Horizontal (default)
1	Rotated 90° counterclockwise from horizontal
2	Rotated 180° counterclockwise from horizontal
3	Rotated 270° counterclockwise from horizontal

Field Origin, Define

Purpose

Defines the origin for a field. The field origin is the upper left corner of the field. Horizontal *n* and vertical *m* locations represent the number of dots from the label's origin (0,0 – the upper left square on the label).

Supported Printers

All

Syntax

o*n,m*

Parameters

n

Horizontal number of dots from the label origin.

Range: 0 to 19999

Default: 0

m

Vertical number of dots from the label origin.

Range: 0 to 19999

Default: 0

Height Magnification of Bar, Box, or UDC, Define

Purpose

Defines the character height magnification of a box, barcode, or user-defined character. Defines the vertical magnification of the character bitmap for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

h*n*

Parameters

n

Height magnification (in dots) of a box, barcode, or user-defined character.

Vertical magnification of the character bitmap for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Box	1 to 9999 dots	100
Barcode	1 to 9999 dots	50
User-defined Character	1 to 999 dots	1
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *If you set n to a number that is too large, the printer uses the highest value it can support.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Length of Line or Box Field, Define

Purpose

Defines the length (in dots) of a line or box.

Supported Printers

All

Syntax

l*n*

Parameters

n

Length of the line or box in dots.

Range: 1 to 1999

Default: 100

In Advanced Mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Width of Line, Box, Bar, or Character, Define

Purpose

Defines the width magnification of a line, box, barcode, or character. Defines the character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

w*n*

Parameters

n

Width magnification (in dots) of a line, box, barcode, or character. Character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Line	1 to 9999 dots	1
Box	1 to 9999 dots	1
Barcode	1 to 99 dots	1
Character	1 to 999 dots	2
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *For Aztec, DataMatrix, and QR Code barcodes, the default value for n is 3.*

In [Advanced mode](), a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Program Mode: Format Editing Commands

Syntax	Command Name
B	Barcode Field, Create or Edit
D	Field, Delete
H	Human-Readable Field, Create or Edit
I	Interpretive Field, Edit
L	Line Field, Create or Edit
Q	RFID Tag Write Field, Create or Edit
U	User-Defined Character Field, Create or Edit
W	Box Field, Create or Edit

Barcode Field, Create or Edit

Purpose

Edits or creates a barcode field.

Supported Printers

All

Syntax

B*n*[,*name*]

Parameters

n

ID number for the barcode field.

Range: 0 to 199

Default: 0

name

(Optional) Name for the barcode field.

Values: Up to eight ASCII characters, but cannot start with a numeric character.

Note: *If you enabled the Interpretive parameter, you automatically create an interpretive field when you create a barcode field.*

Barcode field default parameters:

Parameter	Syntax	Default
Field origin	o	0,0
Field direction	f	0 degrees
Barcode type	c	Code 39
Check digits		Disabled
Prefix		None
Data length		20
Ratio	r	3 to 1
Interpretive	i	Disabled
Height magnification	h	50
Width magnification	w	1

The printer generates an [error code (38)](#) if the field number is out of range.

Box Field, Create or Edit

Purpose

Accesses or creates a box field.

Supported Printers

All

Syntax

W*n*[,*name*]

Parameters

n

ID number of the field.

Range: 3 to 6 and 8 to 19

name

(Optional) Name for the field.

Value: Up to eight ASCII characters, but cannot start with a numeric character.

This table describes the box field parameters.

Parameter	Syntax	Default
Field origin	o	0,0
Field direction	f	0 degrees
Box length	l	100
Box height	h	100
Box width	w	1

Field, Delete

Purpose

Deletes field *n* from the format.

Supported Printers

All

Syntax

D*n*

Parameters

n

ID number of the field to delete from the format.

Range: 0 to 199

Default: 0

Note: *You cannot delete the last field in a format. If you delete the current field, the field pointer points to the next field. If you delete a master field, you also delete all slave fields of that master field.*

Human-Readable Field, Create or Edit

Purpose

Edits or creates a human-readable field.

Supported Printers

All

Syntax

H*n*[,*name*]

Parameters

n

ID number of the field.

Range: 0 to 199

Default: 0

name

(Optional) Name for the field. The name can be up to eight ASCII characters, not including the following semicolon. The field name cannot start with a number.

These are the parameters for the default field:

Parameter	Syntax	Default
Field origin	o	0,0
Field direction	f	0 degrees
Character rotation	r	0 degrees
Font	c	7 x 9 standard
Height magnification	h	2
Width magnification	w	2
Point	k	12
Border	b	0
Data origin	d	Print mode

Interpretive Field, Edit

Purpose

Edits an interpretive field.

Supported Printers

All

Syntax

I*n*

Parameters

n

Field ID number of the barcode field to be interpreted.

Range: 0 to 199

Default: 0

Note: *You cannot create interpretive fields with this command; you can only create or delete them when enabling the interpretive of the corresponding barcode field. This table lists the parameters for the default field.*

Parameter	Syntax	Default
Field origin	o	2 dots below barcode, left justified
Field direction	f	0 degrees
Character rotation	r	0 degrees
Font	c	7 x 9 standard
Height magnification	h	2
Width magnification	w	2
Point	k	12
Border	b	0
Data origin	d	Print mode
Data length		30

Each interpretive field is counted as an individual field in the maximum number of 200 fields (0–199).

Line Field, Create or Edit

Purpose

Accesses or creates a line field.

Supported Printers

All

Syntax

L*n*[,*name*]

Parameters

n

Field number for the line field.

Range: 0 to 199

Default: 0

name

Name for the field of up to eight ASCII characters.

These are the parameters for the default field:

Parameter	Syntax	Default
Field origin	o	0,0
Field direction	f	0 degrees
Line length	l	100
Line width	w	1

RFID Tag Write Field, Create or Edit

Purpose

Edits or creates a field that lets you set up data to write to an RFID tag. If a program mode command parameter is left out, the default value applies. Temporary format settings are lost at reboot.

Supported Printers

All

Syntax

Q*n*

Parameters

n

Field number of the data field.

Range: 0 to 199

Default: 0

These are the parameters for the default field:

Parameter	Syntax	Default
RFID tag field setup	a	1,1,0,8
Field data, define source (write operations only)	d	0,30,0

If the tag write fails, an error status of <EOT> is set. If the write succeeds, a status of <ACK> is set. If auto-transmit level 3 is enabled, an <EOT> status response is returned to the host upon error and an <ACK> upon success.

User-Defined Character Field, Create or Edit

Purpose

Edits or creates a graphic field.

Supported Printers

All

Syntax

U*n*[,*name*]

Parameters

n

Field number of the graphic field.

Range: 0 to 199

Default: 0

name

(Optional) Name for the graphic field.

Value: Up to eight ASCII characters long, cannot use the semicolon character (;), and cannot start with a number.

These are the parameters for the default field:

Parameter	Syntax	Default
Field origin	o	0,0
Field direction	f	0 degrees
Character rotation	r	0 degrees
Height magnification	h	1
Width magnification	w	1

Human–Readable Field Editing Commands

Syntax	Command Name
b	Border Around Human–Readable Text, Define
c	Font Type, Select
d	Field Data, Define Source
f	Field Direction, Define
h	Height Magnification of Bar, Box, or UDC, Define
j	Text Box, Set Justification
k	Point Size, Set
m	Text Box, Set Margins
o	Field Origin, Define
r	Character Rotation or Barcode Ratio, Define
w	Width of Line, Box, Bar, or Character, Define
x	Text Box, Create

Border Around Human-Readable Text, Define

Purpose

Defines a border around a human-readable field.

Supported Printers

All

Syntax

b*n*

Parameters

n

Size of the border in dots. When *n* > 0, field prints white letters with a border of the specified width around the field.

Range: 0 to 199

Default: 0 (no borders, black letters)

Character Rotation or Barcode Ratio, Define

Purpose

Defines the character rotation for human-readable fields or the barcode ratio for a barcode field.

Supported Printers

All

Syntax

r*n*

Parameters

n

Defines the character rotation or barcode ratio.

Values for *n*:

Field Type	Values	Default
Barcode	0: 2.5 to 1 1: 3.0 to 1 2: 2.0 to 1 3: 2.3 to 1	1
Human-readable	0: horizontal 1: 90° counterclockwise	0

Note: *If the barcode width is odd and you select r0, the printer substitutes r1. The narrow elements of this code are always at least 3 dots. To have the shortest symbol, select a width of w = 1.*

Note: *Control characters for bitmap fonts c0, c1, c2, and c7 cannot be printed in rotated orientation.*

Field Data, Define Source

Purpose

Defines a data source for the current field and the number of characters in the field.

Supported Printers

All

Syntax

d*n*[,*m1*][,*m2*]

Parameters

n

Defines the data source:

n	Data Source
0	Data entered in Print mode
1	Data entered in Print mode
2	Data comes from field, *m1*
3	Fixed data
4	Date (from the real–time clock) when the label was imaged.
5	Time (from the real–time clock) when the label was imaged.

m1

Varies depending on value of *n*.

Range: 0 to 3550

If *n* = 0 or 1, *m1* is the maximum number of characters you can enter in the field. For all supported printers, the default value is 20 (barcode fields) or 30 (human–readable fields).

If *n* = 4, *m1* indicates how the date is formatted:

m1	Format for Date
0	YY/MM/DD (default)
1	YYYY/MM/DD
2	DD/MM/YY
3	DD/MM/YYYY

If *n* = 5, *m1* indicates how the time is formatted:

m1	Format for Time
0	HH:MM:SS, 24-hour clock (default)
1	HH:MM, 24-hour clock
2	HH:MM:SS, 12-hour clock
3	HH:MM, 12-hour clock
4	HH:MM:SS am/pm, 12-hour clock
5	HH:MM am/pm, 12-hour clock

m2

(Optional) Varies depending on value of *n*.

If *n* = 0 to 3, *m2* is the positive integer numeric field offset.

Range: 0 to 9999

Default: 0

If *n* = 4, *m2* is the data offset.

Range: -3650 to 3650 (+/- 10 years)

Default: 0

If *n* = 5, *m2* is the data offset. Offsetting the time past midnight does not change the date.

Range: -86400 to 86400 (+/- 1 day)

Default: 0

Note: *Fields using the date or time as data are imaged when the print command is executed. Labels reprinted because of an error or fault condition will have the same time as the original label.*

Note: *Labels printed with the Batch Count, Set command will have the same time. To print a batch of labels with differing time stamps, use the Quantity Count, Set command.*

Note: *Data offset parameter of a slave of a date or time field is ignored.*

Example

These examples demonstrate the syntax for this command.

d0[,*m1*]

d1[,*m1*];

Enter optional data in Print mode. *m1* is the maximum amount of data that you can enter into this field. The default for *m1* is 20 characters for barcode fields, 30 characters for human-readable fields, and 64 characters for RFID fields.

For variable RFID fields, make sure to allow for field separator commands. Also, fields in hex format need at least twice as many characters as defined in the RFID tap setup command. For example, to write 4 hex bytes to a tag, you need to allow at least 8 characters in the variable data field.

d2,*m1*[,*m2*];

Copy data into this field from field *m1*. You must define the field before you can use it. *m2* is an optional positive integer numeric field offset that can range from 0 to 9999, with 0 as the default. You can only offset data delimited by numeric field separator <FS> or alphanumeric field separator <GS>. A barcode field cannot copy data from a human-readable field, but a human-readable field can copy data from a barcode field. You can use up to 19 slave fields in each format,

d3,*m1*;

Fixed data *m1* is stored as part of the format, and you use it every time you print the current field. You cannot change entered data with print commands.

Many formats divide data into separate fields, and then rearrange these fields to fit the RFID tag or composite barcodes. Use the <HT> character to divide the fields to enable you to enter the entire source data with one command.

d4,0;

Sets the field data source to the date according to the real-time clock, and prints the date as YYYY/MM/DD.

This example shows how to separate the fields with <HT>:

<STX>Q3;a3,1;d3,0<HT>4011661<HT>0030000001;<ETX>
<STX><ESC>J3,1<ETX>

Field Direction, Define

Purpose

Defines the field rotation.

Supported Printers

All

Syntax

f*n*

Parameters

n

Defines the field direction:

n	Field Direction
0	Horizontal (default)
1	Rotated 90° counterclockwise from horizontal
2	Rotated 180° counterclockwise from horizontal
3	Rotated 270° counterclockwise from horizontal

Field Origin, Define

Purpose

Defines the origin for a field. The field origin is the upper left corner of the field. Horizontal *n* and vertical *m* locations represent the number of dots from the label's origin (0,0 – the upper left square on the label).

Supported Printers

All

Syntax

o*n,m*

Parameters

n

Horizontal number of dots from the label origin.

Range: 0 to 19999

Default: 0

m

Vertical number of dots from the label origin.

Range: 0 to 19999

Default: 0

Font Type, Select

Purpose

Selects a font type for human-readable and interpretive fields.

Supported Printers

All

Syntax

c*n*[,*m*][,*p*]

Parameters

n

ID number of the font to be uploaded:

n	Font Name	Mapped to Monotype TrueType Fonts
0	7 x 9 Standard (86XX font)	IPLFONT0
1	7 x 11 OCR (86XX font)	IPLFONT1
2	10 x 14 Standard (86XX font)	IPLFONT2
3 - 6	User-defined fonts	
7	5 x 7 Standard (86XX font)	IPLFONT7
8 - 19	User-defined fonts	
20	8 point monospace	Andale Mono
21	12 point monospace	Andale Mono
22	20 point monospace	Andale Mono
23	OCR A	OCR A
24	OCR B size 2	OCR B
25	Swiss Mono 721 standard outline font	Andale Mono
26	Swiss Mono 721 bold outline font	Andale Mono Bold
28	Dutch Roman 801 proportional outline font	CG Times
30	6 point monospace bold	Andale Mono Bold

n	Font Name	Mapped to Monotype TrueType Fonts
31	8 point monospace bold	Andale Mono Bold
32	10 point monospace standard	Andale Mono
33	10 point monospace bold	Andale Mono Bold
34	12 point monospace bold	Andale Mono Bold
35	16 point monospace standard	Andale Mono
36	16 point monospace bold	Andale Mono Bold
37	20 point monospace bold	Andale Mono Bold
38	24 point monospace standard	Andale Mono
39	24 point monospace bold	Andale Mono Bold
40	30 point monospace bold	Andale Mono Bold
41	36 point monospace bold	Andale Mono Bold
50	Kanji outline font	TBMinPro-Light
51	Kanji monospace outline font	TBMinPro-Light
52	Katakana 12 x 16 bitmap	TBMinPro-Light
53	Katakana 16 x 24 bitmap	TBMinPro-Light
54	Katakana 24 x 36 bitmap	TBMinPro-Light
55	Kanji 16 x 16 bitmap	TBMinPro-Light
56	Kanji 24 x 24 bitmap	TBMinPro-Light
57	Kanji	TBMinPro-Light
58	Korean	HYGoThic-Medium
59	Traditional Chinese	MSung HK Medium
60	Simplified Chinese	MSungPRC Medium
61	Swiss 721	Univers
62	Swiss 721 bold	Univers Bold
63	Swiss 721 bold condensed	Univers Condensed Bold
64	Prestige bold	Andale Mono Bold
65	Zurich extra condensed	Univers Extra Condensed
66	Dutch 801 bold	CG Times Bold
67	Century Schoolbook	Century Schoolbook Roman

n	Font Name	Mapped to Monotype TrueType Fonts
68	Futura light	Univers
69	Letter Gothic	Letter Gothic

Fonts 50 to 60 are downloadable Asian fonts. 3 to 6 and 8 to 19 are user-defined fonts. The other fonts are resident in the printer.

m

Intercharacter gap (space between characters). Default is 0. Range is -199 to 399.

p

Name of the font (if the font does not have an ID number).

See Also

[Printer Language, Select](#)

Height Magnification of Bar, Box, or UDC, Define

Purpose

Defines the character height magnification of a box, barcode, or user-defined character. Defines the vertical magnification of the character bitmap for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

h*n*

Parameters

n

Height magnification (in dots) of a box, barcode, or user-defined character.

Vertical magnification of the character bitmap for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Box	1 to 9999 dots	100
Barcode	1 to 9999 dots	50
User-defined Character	1 to 999 dots	1
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *If you set n to a number that is too large, the printer uses the highest value it can support.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Point Size, Set

Purpose

Sets the point size that defines the size of the characters in human-readable fields. You can only use this command in Advanced mode.

Supported Printers

All

Syntax

k*n*

Parameters

n

Character size in human-readable fields.

Range: 4 to 288

Default: 12

Note: *A point size equals 1/72 inch. A higher point size means larger characters.*

You can configure the minimum value of the range in the /home/user/config/ipl/IPL.CFG by modifying the PointSizeMin setting:

PointSizeMin>4

Change the default value of 4 to another value. You need to reboot the printer for the changes to take effect.

IPL Command Reference

Text Box, Create

Purpose

This command creates a box around a human-readable or interpretive field.

Supported Printers

All

Syntax

x[*n1*][,*n2*][,*n3*]

Parameters

n1

Width of the box in pixels.

Default: 0

n2

Height of the box in pixels.

Default: 0

n3

Thickness of the box outline. A thickness of 0 makes the box invisible, but the text field is still bounded by the box.

Default: 0

Note: *If you specify a text box around a human-readable or interpretive field:*

- *To begin a new line, use a carriage return (<CR>). You can also use the space character to begin a new line, if the following word goes beyond the box boundary. To print <CR> as data, precede it with the data shift character (<SUB>).*

- *If a word is too long to fit in the box, the line wraps to the next line and a hyphen is inserted as the last character of the first line. Long words may span more than two lines. Hyphenation may or may not occur between syllables. For best results, avoid long words.*

- *If the amount of text goes beyond the bottom of the box, the text is not clipped and prints in its entirety.*

- *The maximum number of text lines inside the box is 20.*

- *In mirror printing mode (using the Printhead Loading Mode, Select command, or if the borders for the human-readable field are set to white (using the Border Around*

[Human-Readable Text, Define](#) command), the inside of the text box prints solid black and text is imaged in white. Non-zero borders are imaged the same way.

Text Box, Set Justification

Purpose

This command sets the justification for text inside a defined text box.

Supported Printers

All

Syntax

j*n*

Parameters

n

Sets text justification for the text box:

n	Justification
0	Top left corner
1	Top center
2	Top right corner

See Also

[Text Box, Create](#)

Text Box, Set Margins

Purpose

This command sets the margins inside a defined text box.

Supported Printers

All

Syntax

m[*n1*][,*n2*][,*n3*]

Parameters

n1

Horizontal margin: the distance (in dots) between the left or right border and the text.

Range: 0 to half the box width as defined in [Text Box, Create](#)

Default: 5

n2

Vertical margin: the distance (in dots) between the top border and the text.

Range: 0 to half the box height as defined in [Text Box, Create](#)

Default: 5

n3

Separation (in dots) between lines of text.

Range: 0 to 250

Default: 5

See Also

[Text Box, Create](#)

Width of Line, Box, Bar, or Character, Define

Purpose

Defines the width magnification of a line, box, barcode, or character. Defines the character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

w*n*

Parameters

n

Width magnification (in dots) of a line, box, barcode, or character. Character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Line	1 to 9999 dots	1
Box	1 to 9999 dots	1
Barcode	1 to 99 dots	1
Character	1 to 999 dots	2
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *For Aztec, DataMatrix, and QR Code barcodes, the default value for n is 3.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Interpretive Field Editing Commands

Syntax	Command Name
b	Border Around Human-Readable Text, Define
c	Font Type, Select
f	Field Direction, Define
h	Height Magnification of Bar, Box, or UDC, Define
j	Text Box, Set Justification
k	Point Size, Set
m	Text Box, Set Margins
o	Field Origin, Define
r	Character Rotation or Barcode Ratio, Define
w	Width of Line, Box, Bar, or Character, Define
x	Text Box, Create

Border Around Human-Readable Text, Define

Purpose

Defines a border around a human-readable field.

Supported Printers

All

Syntax

b*n*

Parameters

n

Size of the border in dots. When *n* > 0, field prints white letters with a border of the specified width around the field.

Range: 0 to 199

Default: 0 (no borders, black letters)

Character Rotation or Barcode Ratio, Define

Purpose

Defines the character rotation for human-readable fields or the barcode ratio for a barcode field.

Supported Printers

All

Syntax

rn

Parameters

n

Defines the character rotation or barcode ratio.

Values for *n*:

Field Type	Values	Default
Barcode	0: 2.5 to 1 1: 3.0 to 1 2: 2.0 to 1 3: 2.3 to 1	1
Human-readable	0: horizontal 1: 90° counterclockwise	0

Note: *If the barcode width is odd and you select r0, the printer substitutes r1. The narrow elements of this code are always at least 3 dots. To have the shortest symbol, select a width of w = 1.*

Note: *Control characters for bitmap fonts c0, c1, c2, and c7 cannot be printed in rotated orientation.*

Field Direction, Define

Purpose

Defines the field rotation.

Supported Printers

All

Syntax

f*n*

Parameters

n

Defines the field direction:

n	Field Direction
0	Horizontal (default)
1	Rotated 90° counterclockwise from horizontal
2	Rotated 180° counterclockwise from horizontal
3	Rotated 270° counterclockwise from horizontal

Field Origin, Define

Purpose

Defines the origin for a field. The field origin is the upper left corner of the field. Horizontal *n* and vertical *m* locations represent the number of dots from the label's origin (0,0 – the upper left square on the label).

Supported Printers

All

Syntax

o*n*,*m*

Parameters

n

Horizontal number of dots from the label origin.

Range: 0 to 19999

Default: 0

m

Vertical number of dots from the label origin.

Range: 0 to 19999

Default: 0

Height Magnification of Bar, Box, or UDC, Define

Purpose

Defines the character height magnification of a box, barcode, or user-defined character. Defines the vertical magnification of the character bitmap for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

h*n*

Parameters

n

Height magnification (in dots) of a box, barcode, or user-defined character.

Vertical magnification of the character bitmap for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Box	1 to 9999 dots	100
Barcode	1 to 9999 dots	50
User-defined Character	1 to 999 dots	1
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *If you set n to a number that is too large, the printer uses the highest value it can support.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Font Type, Select

Purpose

Selects a font type for human-readable and interpretive fields.

Supported Printers

All

Syntax

c*n*[,*m*][,*p*]

Parameters

n

ID number of the font to be uploaded:

n	Font Name	Mapped to Monotype TrueType Fonts
0	7 x 9 Standard (86XX font)	IPLFONT0
1	7 x 11 OCR (86XX font)	IPLFONT1
2	10 x 14 Standard (86XX font)	IPLFONT2
3 - 6	User-defined fonts	
7	5 x 7 Standard (86XX font)	IPLFONT7
8 - 19	User-defined fonts	
20	8 point monospace	Andale Mono
21	12 point monospace	Andale Mono
22	20 point monospace	Andale Mono
23	OCR A	OCR A
24	OCR B size 2	OCR B
25	Swiss Mono 721 standard outline font	Andale Mono
26	Swiss Mono 721 bold outline font	Andale Mono Bold
28	Dutch Roman 801 proportional outline font	CG Times
30	6 point monospace bold	Andale Mono Bold

n	Font Name	Mapped to Monotype TrueType Fonts
31	8 point monospace bold	Andale Mono Bold
32	10 point monospace standard	Andale Mono
33	10 point monospace bold	Andale Mono Bold
34	12 point monospace bold	Andale Mono Bold
35	16 point monospace standard	Andale Mono
36	16 point monospace bold	Andale Mono Bold
37	20 point monospace bold	Andale Mono Bold
38	24 point monospace standard	Andale Mono
39	24 point monospace bold	Andale Mono Bold
40	30 point monospace bold	Andale Mono Bold
41	36 point monospace bold	Andale Mono Bold
50	Kanji outline font	TBMinPro-Light
51	Kanji monospace outline font	TBMinPro-Light
52	Katakana 12 x 16 bitmap	TBMinPro-Light
53	Katakana 16 x 24 bitmap	TBMinPro-Light
54	Katakana 24 x 36 bitmap	TBMinPro-Light
55	Kanji 16 x 16 bitmap	TBMinPro-Light
56	Kanji 24 x 24 bitmap	TBMinPro-Light
57	Kanji	TBMinPro-Light
58	Korean	HYGoThic-Medium
59	Traditional Chinese	MSung HK Medium
60	Simplified Chinese	MSungPRC Medium
61	Swiss 721	Univers
62	Swiss 721 bold	Univers Bold
63	Swiss 721 bold condensed	Univers Condensed Bold
64	Prestige bold	Andale Mono Bold
65	Zurich extra condensed	Univers Extra Condensed
66	Dutch 801 bold	CG Times Bold
67	Century Schoolbook	Century Schoolbook Roman

n	Font Name	Mapped to Monotype TrueType Fonts
68	Futura light	Univers
69	Letter Gothic	Letter Gothic

Fonts 50 to 60 are downloadable Asian fonts. 3 to 6 and 8 to 19 are user–defined fonts. The other fonts are resident in the printer.

m

Intercharacter gap (space between characters). Default is 0. Range is –199 to 399.

p

Name of the font (if the font does not have an ID number).

See Also

Printer Language, Select

Point Size, Set

Purpose

Sets the point size that defines the size of the characters in human-readable fields. You can only use this command in Advanced mode.

Supported Printers

All

Syntax

k*n*

Parameters

n

Character size in human-readable fields.

Range: 4 to 288

Default: 12

Note: *A point size equals 1/72 inch. A higher point size means larger characters.*

You can configure the minimum value of the range in the /home/user/config/ipl/IPL.CFG by modifying the PointSizeMin setting:

PointSizeMin>4

Change the default value of 4 to another value. You need to reboot the printer for the changes to take effect.

Text Box, Create

Purpose

This command creates a box around a human-readable or interpretive field.

Supported Printers

All

Syntax

x[*n1*][,*n2*][,*n3*]

Parameters

n1

Width of the box in pixels.

Default: 0

n2

Height of the box in pixels.

Default: 0

n3

Thickness of the box outline. A thickness of 0 makes the box invisible, but the text field is still bounded by the box.

Default: 0

Note: *If you specify a text box around a human-readable or interpretive field:*

- *To begin a new line, use a carriage return (<CR>). You can also use the space char-acter to begin a new line, if the following word goes beyond the box boundary. To print <CR> as data, precede it with the data shift character (<SUB>).*

- *If a word is too long to fit in the box, the line wraps to the next line and a hyphen is inserted as the last character of the first line. Long words may span more than two lines. Hyphenation may or may not occur between syllables. For best results, avoid long words.*

- *If the amount of text goes beyond the bottom of the box, the text is not clipped and prints in its entirety.*

- *The maximum number of text lines inside the box is 20.*

- *In mirror printing mode (using the Printhead Loading Mode, Select command, or if the borders for the human-readable field are set to white (using the Border Around*

[Human-Readable Text, Define](#) *command), the inside of the text box prints solid black and text is imaged in white. Non-zero borders are imaged the same way.*

Text Box, Set Justification

Purpose

This command sets the justification for text inside a defined text box.

Supported Printers

All

Syntax

j*n*

Parameters

n

Sets text justification for the text box:

n	Justification
0	Top left corner
1	Top center
2	Top right corner

See Also

[Text Box, Create](#)

Text Box, Set Margins

Purpose

This command sets the margins inside a defined text box.

Supported Printers

All

Syntax

m[*n1*][,*n2*][,*n3*]

Parameters

n1

Horizontal margin: the distance (in dots) between the left or right border and the text.

Range: 0 to half the box width as defined in [Text Box, Create](#)

Default: 5

n2

Vertical margin: the distance (in dots) between the top border and the text.

Range: 0 to half the box height as defined in [Text Box, Create](#)

Default: 5

n3

Separation (in dots) between lines of text.

Range: 0 to 250

Default: 5

See Also

[Text Box, Create](#)

Width of Line, Box, Bar, or Character, Define

Purpose

Defines the width magnification of a line, box, barcode, or character. Defines the character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

w*n*

Parameters

n

Width magnification (in dots) of a line, box, barcode, or character. Character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Line	1 to 9999 dots	1
Box	1 to 9999 dots	1
Barcode	1 to 99 dots	1
Character	1 to 999 dots	2
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *For Aztec, DataMatrix, and QR Code barcodes, the default value for n is 3.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Line Field Editing Commands

Syntax	Command Name
f	Field Direction, Define
l	Length of Line or Box Field, Define
o	Field Origin, Define
w	Width of Line, Box, Bar, or Character, Define

Field Direction, Define

Purpose

Defines the field rotation.

Supported Printers

All

Syntax

f*n*

Parameters

n

Defines the field direction:

n	Field Direction
0	Horizontal (default)
1	Rotated 90° counterclockwise from horizontal
2	Rotated 180° counterclockwise from horizontal
3	Rotated 270° counterclockwise from horizontal

Field Origin, Define

Purpose

Defines the origin for a field. The field origin is the upper left corner of the field. Horizontal *n* and vertical *m* locations represent the number of dots from the label's origin (0,0 – the upper left square on the label).

Supported Printers

All

Syntax

o*n*,*m*

Parameters

n

Horizontal number of dots from the label origin.

Range: 0 to 19999

Default: 0

m

Vertical number of dots from the label origin.

Range: 0 to 19999

Default: 0

Length of Line or Box Field, Define

Purpose

Defines the length (in dots) of a line or box.

Supported Printers

All

Syntax

l*n*

Parameters

n

Length of the line or box in dots.

Range: 1 to 1999

Default: 100

In [Advanced Mode](#), a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Width of Line, Box, Bar, or Character, Define

Purpose

Defines the width magnification of a line, box, barcode, or character. Defines the character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

w*n*

Parameters

n

Width magnification (in dots) of a line, box, barcode, or character. Character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Line	1 to 9999 dots	1
Box	1 to 9999 dots	1
Barcode	1 to 99 dots	1
Character	1 to 999 dots	2
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *For Aztec, DataMatrix, and QR Code barcodes, the default value for n is 3.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Page Editing Commands

Syntax	Command Name
e	Data Source for Format in a Page, Define
M	Format Position in a Page, Assign
m	Format Position From Page, Delete
O	Format Offset Within a Page, Define
q	Format Direction in a Page, Define
S	Page, Create or Edit
s	Page, Delete

Data Source for Format in a Page, Define

Purpose

Defines a data source for a format assigned to a page position.

Supported Printers

All

Syntax

e*n*[,*m1*][,*m2*]

Parameters

n

Defines the data source:

n	Description
0	Format receives its data during Print mode (default).
1	Format is a slave of another format within this page.

m1

Position of the master format within the page.

Default: a

m2

Data offset to apply to the slave format. You can only offset data that is delimited by numeric field separator <FS> or alphanumeric field separator <GS>.

Default: 0

Note: *The format ID must be the same for both the master and slave formats.*

Format Direction in a Page, Define

Purpose

Defines the format directions within a page.

Supported Printers

All

Syntax

q*n*

Parameters

n

Format direction:

n	Direction
0	Horizontal (default)
1	Rotated 90º counterclockwise from horizontal
2	Rotated 180º counterclockwise from horizontal
3	Rotated 270º counterclockwise from horizontal

Format Offset Within a Page, Define

Purpose

Defines the format offsets within a page. Creates new origins for fields within a format by adding the format offsets to the original field offsets.

Supported Printers

All

Syntax

O*n,m*

Parameters

n,m

Increments of dot sizes.

Range: 0 to 19999

Default: 0

Format Position From Page, Delete

Purpose

Deletes the format position *p* from a page, where *p* is the page position.

Supported Printers

All

Syntax

m*p*

Parameters

p

Page position.

Range: a to z

Default: a

Format Position in a Page, Assign

Purpose

Assigns a specified format to a page position.

Supported Printers

All

Syntax

M*p*,*n*

Parameters

p

Page position.

Range: a to z

Default: a

n

ID number of the format to assign.

Range: 0 to 99

Note: *A format may be in multiple positions.*

The printer generates an [error code (36)](#) if the format ID is out of range.

Programming Commands

Syntax	Command Name
A or F	Format, Create or Edit
E	Format, Erase
G	User–Defined Character, Clear or Create
R	Program Mode, Exit
T	Bitmap User–Defined Font, Clear or Define

Bitmap User-Defined Font, Clear or Define

Purpose

Clears or creates a user-defined bitmap font set. The font ID number is *n*.

Supported Printers

All

Syntax

T*n*[,*name*]

Parameters

n

Font ID number.

Range: 3 to 6 and 8 to 19

name

(Optional) Name for the user-defined font of up to eight ASCII characters.

Note: *If you already defined font set n, the printer erases all previous characters in the font. You can recreate an existing font, but you cannot edit it. To change any characters, you must transmit the entire font set.*

Format, Create or Edit

Purpose

Edits or creates a format.

Supported Printers

All

Syntax

A*n*[,*name*] or F*n*[,*name*]

Parameters

n

Format ID number. If you use an asterisk (*) for the label format, the printer does not store the label format in permanent memory. When you turn the printer off, the printer loses the label format.

Range: 1 to 99

The printer generates an error code (36) if the format number is out of range.

name

(Optional) Name for the format. The field can be up to eight ASCII characters but cannot start with a numeric character.

Format, Erase

Purpose

Erases format ID number *n*.

Supported Printers

All

Syntax

E*n*

Parameters

n

ID number of the format you want to erase.

Values: 1 to 99

Page, Create or Edit

Purpose

Edits or creates a page.

Supported Printers

All

Syntax

S*n*

Parameters

n

Numeric page ID.

Range: 1 to 9

Note: *You cannot edit the default page (page 0).*

The printer generates an error code (26) if a page number is out of range.

Example

```
<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E1;F1;<ETX>
<STX>H0;o1000,100;f3;b10;c0;h3;w2;d0,35<ETX>
<STX>H1;o300,250;c0;f3;h3;w3;<ETX>
<STX>B2;o250,100;c0;f3;h200;w2;i1;<ETX>
<STX>W3;o25,50;l300;h600;w5;<ETX>
<STX>R<ETX>
<STX><ESC>P<ETX>
<STX>E2;F2;<ETX>
<STX>H0;o800,250;c0;f3;h3;w3;<ETX>
<STX>B1;o750,100;c0;f3;h200;w2;i1;<ETX>
<STX>W2;o525,50;l300;h600;w5;<ETX>
<STX>R<ETX>
<STX><ESC>P<ETX>
<STX>S1;Ma,1;O0,0;Mb,2;O0,0<ETX>
<STX>R<ETX>
<STX><ESC>G1<CAN><ETX>
<STX><ESC>Ea<ETX>
<STX>Example using the page command<CR><ETX>
<STX>Format 1<CR><ETX>
<STX>Format1<STX>
<STX><ESC>Eb<ETX>
<STX>Format 2<CR><ETX>
<STX>Format2<STX>
<STX><US>1<ETX>
<STX><RS>1<ETX>
<STX><ETB><ETX>
<STX><ESC>G0<ETX>
```

Page, Delete

Purpose

Deletes a page.

Supported Printers

All

Syntax

s*n*

Parameters

n

Numeric page ID.

Range: 1 to 9

Note: *You cannot delete the default page (page 0).*

User-Defined Character, Clear or Create

Purpose

Clears or creates a graphic bitmap.

Supported Printers

All

Syntax

G*n*[,*name*]

Parameters

n

Field number of the graphic field.

Range: 0 to 99

name

(Optional) Name for the graphic field.

Value: Up to eight ASCII characters long, cannot use the semicolon character (;), and cannot start with a number.

Note: *If you already defined graphic n, the printer erases it and redefines it.*

RFID Tag Editing Commands

Syntax	Command Name
a	[RFID Tag Field Setup](#)
d	[Field Data, Define Source](#)
Q	[RFID Tag Write Field, Create or Edit](#)
a	[RFID Tag Field Setup](#)

Field Data, Define Source

Purpose

Defines a data source for the current field and the number of characters in the field.

Supported Printers

All

Syntax

d*n*[,*m1*][,*m2*]

Parameters

n

Defines the data source:

n	Data Source
0	Data entered in Print mode
1	Data entered in Print mode
2	Data comes from field, *m1*
3	Fixed data
4	Date (from the real-time clock) when the label was imaged.
5	Time (from the real-time clock) when the label was imaged.

m1

Varies depending on value of *n*.

Range: 0 to 3550

If *n* = 0 or 1, *m1* is the maximum number of characters you can enter in the field. For all supported printers, the default value is 20 (barcode fields) or 30 (human-readable fields).

If *n* = 4, *m1* indicates how the date is formatted:

m1	Format for Date
0	YY/MM/DD (default)
1	YYYY/MM/DD
2	DD/MM/YY
3	DD/MM/YYYY

If *n* = 5, *m1* indicates how the time is formatted:

m1	Format for Time
0	HH:MM:SS, 24–hour clock (default)
1	HH:MM, 24-hour clock
2	HH:MM:SS, 12-hour clock
3	HH:MM, 12-hour clock
4	HH:MM:SS am/pm, 12-hour clock
5	HH:MM am/pm, 12-hour clock

m2

(Optional) Varies depending on value of *n*.

If *n* = 0 to 3, *m2* is the positive integer numeric field offset.

Range: 0 to 9999

Default: 0

If *n* = 4, *m2* is the data offset.

Range: –3650 to 3650 (+/– 10 years)

Default: 0

If *n* = 5, *m2* is the data offset. Offsetting the time past midnight does not change the date.

Range: –86400 to 86400 (+/– 1 day)

Default: 0

Note: *Fields using the date or time as data are imaged when the print command is executed. Labels reprinted because of an error or fault condition will have the same time as the original label.*

Note: *Labels printed with the Batch Count, Set command will have the same time. To print a batch of labels with differing time stamps, use the Quantity Count, Set command.*

Note: *Data offset parameter of a slave of a date or time field is ignored.*

Example

These examples demonstrate the syntax for this command.

d0[,*m1*]

d1[,*m1*];

Enter optional data in Print mode. *m1* is the maximum amount of data that you can enter into this field. The default for *m1* is 20 characters for barcode fields, 30 characters for human-readable fields, and 64 characters for RFID fields.

For variable RFID fields, make sure to allow for field separator commands. Also, fields in hex format need at least twice as many characters as defined in the RFID tap setup command. For example, to write 4 hex bytes to a tag, you need to allow at least 8 characters in the variable data field.

d2,*m1*[,*m2*];

Copy data into this field from field *m1*. You must define the field before you can use it. *m2* is an optional positive integer numeric field offset that can range from 0 to 9999, with 0 as the default. You can only offset data delimited by numeric field separator <FS> or alphanumeric field separator <GS>. A barcode field cannot copy data from a human-readable field, but a human-readable field can copy data from a barcode field. You can use up to 19 slave fields in each format,

d3,*m1*;

Fixed data *m1* is stored as part of the format, and you use it every time you print the current field. You cannot change entered data with print commands.

Many formats divide data into separate fields, and then rearrange these fields to fit the RFID tag or composite barcodes. Use the <HT> character to divide the fields to enable you to enter the entire source data with one command.

d4,0;

Sets the field data source to the date according to the real-time clock, and prints the date as YYYY/MM/DD.

This example shows how to separate the fields with <HT>:

<STX>Q3;a3,1;d3,0<HT>4011661<HT>0030000001;<ETX>
<STX><ESC>J3,1<ETX>

RFID Tag Field Setup

Purpose

Defines an RFID tag field for the write command.

Supported Printers

All

Syntax

a*n,m,p,q*

Parameters

n

Format number of a tag format for the source data:

n	Format Type
0	NUM
1	HEX (default)
2	ASCII
3	SSCC-96
4	SSCC-64
5	SGTIN-96
6	SGTIN-64
7	EPC-URN
8	EPC-HEX96
9	EPC-HEX64
10	SGLN-96
11	SGLN-64
12	GRAI-96
13	GRAI-64
14	GIAI-96
15	GIAI-64
16	GID-96

n	Format Type
17	USDOD-96
18	USDOD-64

m

Tag segment from which data is read or to which data is written:

m	Tag segment
1	ID (default)
2	Data
3	All
10	Reserved
11	EPC
12	TID
13	User

Segments 10 to 13 are supported only by EPCglobal Gen 2 tags.

p

First byte of the declared segment (*m*) on the aligned tag to which data is written. The first byte of a segment is always 0, regardless of the segment's physical location on the tag.

Default: 0

q

Number of bytes on the tag reserved for written data to be written, starting at the position stated by the start of field data command. The length of field data may differ, depending on the segment and tag air interface ISO standard.

Default: 8

This table shows how the NUM, HEX, or ASCII formats affect how data is stored on the tag. The Data column shows the original field data. Depending on the format you select (NUM, HEX, ASCII), the appropriate column shows you the data (in hex) that is stored on the tag.

Data	NUM	HEX	ASCII
ABCD	Not applicable, because the data is not numeric.	AB,CD	41,42,43,44

Data	NUM	HEX	ASCII
1234	00,00,04,D2 Hex equivalent of the number 1234.	12,34	31,32,33,34
ABC	Not applicable, because the data is not numeric.	Not applicable, because the data does not contain an even number of digits (pairs).	42,42,43
RFID	Not applicable, because the data is not numeric.	Not applicable, because the data is not in hex.	52,46,49,44
257	00,00,01,01	Not applicable, because the data does not contain an even number of digits (pairs).	32,35,37

See Also

[RFID Tag Formats](#)

RFID Tag Write Field, Create or Edit

Purpose

Edits or creates a field that lets you set up data to write to an RFID tag. If a program mode command parameter is left out, the default value applies. Temporary format settings are lost at reboot.

Supported Printers

All

Syntax

Q*n*

Parameters

n

Field number of the data field.

Range: 0 to 199

Default: 0

These are the parameters for the default field:

Parameter	Syntax	Default
RFID tag field setup	a	1,1,0,8
Field data, define source (write operations only)	d	0,30,0

If the tag write fails, an error status of <EOT> is set. If the write succeeds, a status of <ACK> is set. If auto-transmit level 3 is enabled, an <EOT> status response is returned to the host upon error and an <ACK> upon success.

RFID Tag Formats

This section includes details and descriptions of RFID tag formats. Tag formats are selected with the RFID Tag Field Setup command:

- EPC-HEX64
- EPC-HEX96
- EPC-URN
- GIAI-64
- GIAI-96
- GID-96
- GRAI-64
- GRAI-96
- SGLN-64
- SGLN-96
- SGTIN-64
- SGTIN-96
- SSCC-64
- SSCC-96
- USDOD-64
- USDOD-96

RFID Tag, Read

Purpose

Tells the printer to read the data from the RFID tag.

Supported Printers

All

Syntax

<ESC>J*n,m,p,q*

Parameters

n

Specifies the data format used on the tag:

n	Format Type
0	NUM
1	HEX (default)
2	ASCII
3	SSCC-96
4	SSCC-64
5	SGTIN-96
6	SGTIN-64
7	EPC-URN
8	EPC-HEX96
9	EPC-HEX64
10	SGLN-96
11	SGLN-64
12	GRAI-96
13	GRAI-64
14	GIAI-96
15	GIAI-64
16	GID-96

n	Format Type
17	USDOD-96
18	USDOD-64

m

Tag segment from which data is read:

m	Segment
1	ID (default)
2	Data
3	All

p

First byte of the declared segment (*m*) from which the data is read (start of read). The first byte of the segment is always 0, regardless of the segment's physical location on the tag.

Default: 0

q

Number of bytes of data that are read (length of read). The length of field data may differ depending on the segment and tag air interface ISO standard.

Default: 8

Note: *If the tag read fails, an error status of <SOH> is set.*

RFID Tag Void Text, Set

Purpose

Defines the text that is printed on labels with bad RFID tags. When the RFID module cannot communicate with the tag on the label, this text is printed at the start of the label or at the maximum retract distance from the tag. This text cannot be changed from the control panel.

Supported Printers

All

Syntax

<SI>K*n*

Parameters

n

Tag void text to be printed. If *n* is blank, this command is disabled.

Range: 0 to 16 ASCII characters

Default: "VOID"

Note: *Text prints using font 26, with 1.27 cm (0.5 in) tall characters printed in the down direction.*

User–Defined Character Editing Commands

Syntax	Command Name
u	Graphic or UDC, Define
x	Bitmap Cell Width for Graphic or UDF, Define
y	Bitmap Cell Height for Graphic or UDF, Define

Bitmap Cell Height for Graphic or UDF, Define

Purpose

Defines the height of a graphic or user–defined font.

Supported Printers

All

Syntax

y*n*

Parameters

n

Height of the graphic or user–defined font. For a bitmap font or graphic, *n* is the number of rows. For outline fonts, *n* is the height of the base character in dots.

Range: 1 to 799

Default:

Type	Default for *n*
Bitmap fonts	1
Outline fonts	10
Graphics	50

Note: *All printers generate an* <u>error code (52)</u> *for an invalid height value.*

Bitmap Cell Width for Graphic or UDF, Define

Purpose

Defines the maximum width for a graphic or any character in a font. Each character has a width within this amount, which should be at least as wide as the widest character in the font.

Supported Printers

All

Syntax

x*n*

Parameters

n

Number of columns for the UDC, bitmap, or user–defined font.

Range: 1 to 799

Default: 1

Note: *All printers generate an error code (52) for an invalid width.*

Graphic or UDC, Define

Purpose

Maps one column of bitmap for a graphic or a font character. *n* is the column to be mapped.

Supported Printers

All

Syntax

u*n,m…m*

Parameters

n

Number of the column to be mapped.

Range: 1 to 799

m…m

Advanced mode: Data byte representing 6 bits of the bitmap.

Emulation mode: A string of 1s and 0s that make up the column and specify whether to print in that row element of the column:

m	Description
0	Do not print in the row element.
1	Print in the row element.

Unmapped columns or row elements default to 0.

User–Defined Character Field Editing Commands

Syntax	Command Name
c	[Graphic, Select](#)
f	[Field Direction, Define](#)
h	[Height Magnification of Bar, Box, or UDC, Define](#)
o	[Field Origin, Define](#)
w	[Width of Line, Box, Bar, or Character, Define](#)

Graphic, Select

Purpose

Selects a graphic for graphic fields.

Supported Printers

All

Syntax

c*n*

Parameters

n

ID number of the graphic to select.

Range: 0 to 99

Default: 0

Note: *This command applies to graphic fields only.*

Field Direction, Define

Purpose

Defines the field rotation.

Supported Printers

All

Syntax

f*n*

Parameters

n

Defines the field direction:

n	Field Direction
0	Horizontal (default)
1	Rotated 90° counterclockwise from horizontal
2	Rotated 180° counterclockwise from horizontal
3	Rotated 270° counterclockwise from horizontal

Height Magnification of Bar, Box, or UDC, Define

Purpose

Defines the character height magnification of a box, barcode, or user–defined character. Defines the vertical magnification of the character bitmap for human–readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

h*n*

Parameters

n

Height magnification (in dots) of a box, barcode, or user-defined character.

Vertical magnification of the character bitmap for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Box	1 to 9999 dots	100
Barcode	1 to 9999 dots	50
User–defined Character	1 to 999 dots	1
Graphics	1 to 250	1
Human–readable	1 to 250	2
POSTNET	1 to 250	2

Note: *If you set n to a number that is too large, the printer uses the highest value it can support.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Field Origin, Define

Purpose

Defines the origin for a field. The field origin is the upper left corner of the field. Horizontal *n* and vertical *m* locations represent the number of dots from the label's origin (0,0 – the upper left square on the label).

Supported Printers

All

Syntax

o*n*,*m*

Parameters

n

Horizontal number of dots from the label origin.

Range: 0 to 19999

Default: 0

m

Vertical number of dots from the label origin.

Range: 0 to 19999

Default: 0

Width of Line, Box, Bar, or Character, Define

Purpose

Defines the width magnification of a line, box, barcode, or character. Defines the character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Supported Printers

All

Syntax

w*n*

Parameters

n

Width magnification (in dots) of a line, box, barcode, or character. Character width magnification for human-readable fields, graphics, and the POSTNET symbology.

Values for *n*:

Field Type	Range	Default
Line	1 to 9999 dots	1
Box	1 to 9999 dots	1
Barcode	1 to 99 dots	1
Character	1 to 999 dots	2
Graphics	1 to 250	1
Human-readable	1 to 250	2
POSTNET	1 to 250	2

Note: *For Aztec, DataMatrix, and QR Code barcodes, the default value for n is 3.*

In Advanced mode, a dot is:

- 5 mil for a 200 dpi printer.
- 3.3 mil for a 300 dpi printer.
- 2.5 mil for a 400 dpi printer.

Test and Service Commands

You can view test and service commands listed alphabetically:

by [name](#).

by [syntax](#).

Using Test and Service Commands

You can use Test and Service commands to query the printer for hardware diagnostic information. Test and Service commands are effective when the printer is in Test and Service mode. You can switch the printer to Test and Service mode with this command:

<ESC>T

All commands in Test and Service mode end with the command terminator (;) except for the last command in a message.

Test and Service Commands by Name

Command Name	Syntax
Command Terminator	;
Dark Adjust	K
Factory Defaults, Reset	D
Formats, Print	f
Hardware Configuration Label, Print	h
Pages, Print	p
Print Quality Label, Print	Q
Program Mode, Exit	R
Software Configuration Label, Print	s
Test and Service Mode, Exit	R
User-Defined Characters (UDC) and Graphics, Print	g
User-Defined Fonts, Print	t

Test and Service Commands by Syntax

Syntax	Command Name
;	Command Terminator
D	Factory Defaults, Reset
f	Formats, Print
g	User–Defined Characters and Graphics, Print
h	Hardware Configuration Label, Print
K	Dark Adjust
p	Pages, Print
Q	Print Quality Label, Print
R	Program Mode, Exit
R	Test and Service Mode, Exit
s	Software Configuration Label, Print
t	User–Defined Fonts, Print

Unsupported IPL Commands

Although most legacy IPL commands are supported, this table lists commands not supported in the current release of IPL.

Syntax	Command Name
<ESC><SYN>	Message Delay, Set
<ESC>Z	User-Defined Tables, Transmit
<SI>a	Audible Alarm, Enable or Disable
<SI>b	Takeup Motor Torque, Increase
<SI>E	Display and Power Management Configuration, Set
<SI>H	Printhead Pressure, Set
<SI>I	Number of Image Bands, Set
<SI>i	IBM Language Translation, Enable or Disable
<SI>M	VOID Tag Signal for Applicator Port
<SI>N	Amount of Storage, Define
<SI>O	Online or Offline on Power-Up
<SI>p	Pin 11/20 Protocol, Set
<SI>s	Interlabel Ribbon Save, Enable or Disable
<SI>U	Printhead Test Parameters, Set
<SI>Z	Ribbon Save Zones, Set
<SYN>	Intercharacter Delay, Set
<SI>Bs,ACTIVE,1	Activate Settings, Set (Bluetooth)
<SI>Bs,AUTH,n	Bluetooth Authentication, Set
<SI>Bs,CONNECT	Connectable State, Set
<SI>Bs,ENCRYPT,n	Bluetooth Encryption, Set
<SI>Bs,FACTORYDEF,1	Factory Default, Set
<SI>Bt,ACTIVE	Activate Settings, Transmit
<SI>Bt,AUTH	Bluetooth Authentication, Transmit
<SI>Bt,CONNECT	Connectable State, Transmit
<SI>Bt,ENCRYPT	Bluetooth Encryption, Transmit
<SI>Bt,FACTORYDEF	Factory Default, Transmit
<SI>Bt,FIRMWARE	Firmware Version, Transmit

Syntax	Command Name
<SI>ws,ACTIVE,1	Activate Settings, Set (Wireless)
<SI>ws,AUTH	Wireless 802.11 Authentication, Set
<SI>ws,WPA	WPA, Set
<SI>ws,WPA2	WPA2, Set
<SI>wt,ACTIVE	Activate Settings, Transmit
<SI>wt,STATE	State, Transmit
<SI>wt,WPA	WPA, Transmit
<SI>wt,WPA2	WPA2, Transmit
<SI>Z	Ribbon Save Zones, Set
B	Printhead Resistance Test, Begin
C	Command Tables, Load
C	Pitch Label, Print
G	Transmissive Sensor Value, Transmit
g	Pitch Size, Set
I	RFID Module Firmware Upgrade
J	Outline Font, Clear or Create
j	Outline Font, Download
L	Label Path Open Sensor Value, Transmit
M	Reflective Sensor Value, Transmit
N	Current Edit Session, Save
P	Printhead Temperature Sensor Value, Transmit
p	Code 39 Prefix Character, Define
S	Printhead Resistance Values, Transmit
T	Label Taken Sensor Value, Transmit
t	User-Defined Fonts, Print
U	12 Volt Supply Value, Transmit
V	Printhead Volt Supply Value, Transmit
v	Print Line Dot Count Limit, Set

TROUBLESHOOTING

This section describes the problems that may occur as a result of using IPL commands incorrectly. If you do not find your problem listed here, see the troubleshooting information in your printer user manual.

For additional troubleshooting help, see these sections:

How the Printer Handles Error Conditions

Interpret Error Codes and Solve Problems

To troubleshoot your printer

1. Send the Error Code, Request command (syntax <BEL>) to the printer and see if the printer returns an error message.

2. If the printer returns an error message, find the error message in Interpret Error Codes and Solve Problems. Follow the instructions in the table to correct the problem.

   If the printer does not return an error message, try to locate the symptom in the "Printer Operation Problems" and "Print Quality Problems" sections of the printer user manual. Follow the instructions in the manual to correct the problem.

3. Clean the printer components and check all connections. For more information, see the user manual for your printer.

4. If the problem persists, contact Customer Support

How to Interpret Error Codes and Solve Problems

Most of the problems you may encounter cause the printer to send an error code to the host. To correct the error, find the error code in the table and complete the instructions in the solution column.

Error Code	Description of Problem	Solution
00	No error.	No action is necessary.
02	Invalid number of barcode characters (EAN/UPC).	Verify the number of barcode characters used.
11	Invalid barcode data.	Verify data in the label format.
21	Quantity or batch count out of range.	Quantity of labels or number of batches should be between 1 and 9999.
22	Field increment/decrement out of range.	Quantity should be between 1 and 9999.
25	Invalid format transmission syntax.	Check the Format, Transmit command syntax.
26	Invalid page transmission syntax.	Check the Page, Transmit command syntax.
27	Invalid font transmission syntax.	Check the Font, Transmit command syntax.
28	Invalid UDC transmission syntax.	Check the User-Defined Characters, Transmit command syntax.
34	Invalid escape command.	Correct the escape command syntax.
35	Invalid data shift (<SI>) command.	Correct the data shift (<SI>) command syntax.
36	Invalid or undefined format number.	Verify that the format numbers are between 0 and 19.
38	Invalid or undefined field number.	Verify the field number in the label format.
41	Syntax error for program commands.	Check the program command for proper syntax.

Error Code	Description of Prob-lem	Solution
43	Too many fields in label format.	You can use up to 200 fields in a format and each field can use up to 250 characters. Reduce field size or delete some fields.
52	Invalid UDC/UDF bit-map cell height/width or intercharacter space.	Verify that the UDC/UDF bitmap cell height/width or intercharacter space is within the specified values for *n*. For more information, see these commands: • Bitmap Cell Height for Graphic or UDF, Define command • User-Defined Character Field, Create or Edit command • Intercharacter Space for UDF, Define command
54	Invalid UDC command syntax.	Correct the UDC command syntax.
57	Invalid parameter.	Correct the syntax.
60	No RFID support.	The printer is unable to access the RFID module. Contact your local Honeywell representative.
61	No RFID tag found.	The RFID module has determined that the printer does not have RFID media loaded. Load RFID media. Verify that the TAGADJUST value aligns the tag over the antenna.
62	Access outside of the RFID tag memory.	The defined RFID tag field specifies a position out-side of the tag's memory or the tag read/write oper-ation was not successful (bad tag). Verify that the field specifies a position within the tag's memory.
63	RFID number con-version error.	An invalid hex or numerical (NUM) format was entered in the data string. Enter a valid value.
64	RFID inactive (off).	The printer has an RFID module and RFID commands have been defined, but RFID mode is turned off. Turn RFID mode on.
65	RFID tag type does not support the selected option.	An application sent a command with an argument that is not supported by the printer's tag type. Verify that the application commands match the printer's tag type.

Error Code	Description of Problem	Solution
66	RFID module over-heated.	The printer RFID module has exceeded its recommended operating temperature and shut down automatically. Wait until the module has cooled to the recommended operating temperature before you try to print tags again.
67	RFID module duty cycle exceeded.	The printer RFID module has exceeded its recommended duty cycle and shut down automatically. You may need to check the RFID module settings.
68	RFID lock error.	You are trying to write data to a locked RFID tag.
69	RFID Access error.	Check the syntax for the RFID Tag Write Field, Create or Edit command.
72	Unsupported command.	An unsupported Wireless or Bluetooth command was entered. Refer to the list of unsupported IPL commands.

See Also

Barcode, Select Type command

Basic Reader Interface (BRI) Programmer Reference Manual

RFID Parameters, Set command

RFID Tag Field Setup command

How the Printer Handles Error Conditions

This section describes how the printer handles error conditions that may occur while you use IPL commands.

If the printer enters an error state, IPL will process only the immediate commands. Other commands will not be processed with the exception of <SI>T and <SI>g commands. After you clear the error, commands will be processed normally.

Syntax Errors

The printer responds to syntax errors in the messages it receives from the host by attempting to execute the commands. It does not ignore a command with a syntax error; instead, the printer produces output, even if it is wrong. This output helps determine what went wrong and what should be done to correct the problem.

Parameter Errors

Certain commands require optional parameters. If you do not supply these parameters, the printer substitutes default values. If a parameter is above its maximum range limit, the printer uses the maximum value. If it falls below the minimum range, the printer uses the minimum value.

Image Overrun Errors

Image overrun occurs when a label is too complex to image for a given print speed. An overrun will cause the printer to abort the label being printed. This error is most common on labels over 12.7 cm (5 in) long.

The printer automatically attempts to correct for this error condition by resetting to the lowest print speed and to the highest number of image bands, and then repeats printing the label. The printer remains at this setting until you reset it. If an image overrun still occurs, printing for that batch of labels stops and the printer executes any following commands.

Installing more memory may decrease image overrun errors.

Invalid Numeric Character Errors

If you include non-numeric characters in a numeric data string in a command, the printer ignores them and continues to process the rest of the valid numeric characters. But, if a non-numeric character begins the numeric data string, the printer uses a default value for the affected command.

For example:

- Valid: 12a
- Valid: 1a2
- Invalid: a12

Insufficient Storage Memory Errors

Before storing new formats, graphics, or user-defined fonts in the static RAM or flash, the printer ensures that it has sufficient memory to store them. If there is insufficient memory, the printer ignores the last editing session and preserves the existing data in the storage memory.

Rename Your Files

IPL images must follow this specific naming convention:

UDC<ID>.LOGO

where <ID> is the IPL image number with a value from 0 to 99.

For example, if you have a company logo named MyLogo.png and you want to print it as image ID 7, rename the file:

MyLogo.png => UDC7.LOGO

Transfer Graphics to the Printer

You can transfer graphics to the printer without having to use a printer-specific format using the printer web page, a USB storage device, or FTP. The printers will print .bmp, .pcx, or .png files of one-bit depth.

Here is the basic process for transferring graphics:

1. Rename your files to UDC<ID>.LOGO.

2. Transfer the renamed files using the printer web page, a USB storage device, or FTP.

3. You can verify that the graphics transferred correctly by viewing them on the printer web page, through FTP, or by sending this IPL command to the printer: <STX><ESC>u<ETX>

Transfer Graphics with a USB Storage Device

1. Insert an empty USB storage device with only a single partition into your PC.

2. On your PC, create a folder on the USB storage device named "images." Make sure the word "images" is in all lowercase letters.

3. Copy the renamed graphics to the "images" folder on the USB storage device.

4. Remove the USB storage device from your PC.

5. Transfer the graphics to the printer:

   - If the printer is off:
     a. Insert the USB storage device in an available slot on the printer.

     b. Turn the printer on.

     c. The graphics are installed automatically as the printer starts up.

   - If the printer is on, from the Ready screen:
     a. Insert the USB storage device in an available slot on the printer.

     b. When the USB menu appears, select **Install Resources**.

     c. Choose to install All images or install the images one at a time by tapping on each graphic.

Transfer Graphics with FTP

1. Start your favorite FTP client and then log onto the printer using the "user" login.

2. Copy the graphics to the home/user/images folder.

Transfer Graphics with the Printer Web Page

1. Open your web browser.

2. Type the IP address of your printer into the address bar.

3. When your printer web page appears, navigate to Manage/Images and add your images one at a time.

Printer Language, Select

Purpose

Selects the printer language.

Supported Printers

All

Syntax

<SI>l*n*

Parameters

n

Specifies the language.

Default: 0

Values for *n*:

n	Language
0	U.S.A.
1	United Kingdom
2	Germany
3	Denmark
4	France
5	Sweden
6	Italy
7	Spain
8	8-Bit ASCII
9	Switzerland
10	Code Page 850
11	Code Page 1250, Central Europe
12	Code Page 1251, Cyrillic, Russian
13	Code Page 1252, Latin 1, Western Europe
14	Code Page 1253, Greek

n	Language
15	Code Page 1254, Turkish
16	Code Page 1255, Hebrew
17	Code Page 1256, Arabic
18	Code Page 1257, Baltic Rim
19	Code Page 1258, Vietnamese
20	Code Page 874, Thai
30	Code Page 932, Shift JIS, Japanese
31	Code Page 936, GB 2312-80, Simplified Chinese
32	Code Page 949, KSC5601, Korean Hangeul
33	Code Page 950, Big 5, Traditional Chinese
40	UTF-8

Note: *You can only select one printer language per print job. Bitmap user-defined fonts (including bitmap TrueType) do not use code pages. If your label format requires several language fonts, you can:*

- *specify a different language for each human-readable or interpretive field.*

- *create bitmap version of the TrueType fonts.*

- *create your own bitmap fonts.*

Resident fonts (those that were installed at the factory) use languages 0 through 10. The default setting probably provides all the special characters you will need, but you may need to determine if one of the other installed languages is better for your application. Code pages 11 through 33 do not work with resident fonts.

If you are using a TrueType font (not bitmap), you must match the code page to your language needs. Do not use languages 0 through 10 with scalable TrueType fonts.

If you are using a downloaded outline (that is, not bitmap) Japanese, Chinese, or Korean TrueType font, you must first locate the correct code page and download it to your printer. (All others are already stored in your printer.) Select the corresponding code page using the Printer Language, Select command.

UTF-8 data is encoded using sequences of 1 to 4 bytes. This table summarizes the different byte sequences of UTF-8 data that is transformed to a character number. The UTF-8 byte sequence (x, y, and z bits) in this table represents a character number in the range of the left column.

Character Number Range	UTF-8 Byte Sequence
0000 to 007F, xxxxxxx	0xxxxxxx
0080 to 07FF, yyyyyxxxxxx	110yyyyy 10xxxxxx

Character Number Range	UTF–8 Byte Sequence
0800 to FFFF, zzzzyyyyyyxxxxxx	1110zzzz 10yyyyyy 10xxxxxx
10000 to 10FFFF, TBD	TBD

The character number is calculated by getting the lower-order bits from the last byte of the sequence and proceeding to the left until there are no x, y, and z bits left. For example, the UTF–8 byte sequence to print a Greek "e" is 0xCE 0xB5.

Font 61 has the most international characters of all of the resident fonts.

See Also:

Download Fonts to the Printer

Font Type, Select

ASCII Tables and International Character Sets

ISO 646 Subset Characters

Character	Description
0-9	
FNC1	
A to Z	
!	Exclamation mark
	Quotation mark
%	Percent sign
&	Ampersand
	Apostrophe
(	Left parenthesis
)	Right parenthesis
*	Asterisk
+	Plus sign
,	Comma
-	Minus or hyphen
.	Period or full stop
/	Slash or solidus
:	Colon
;	Semicolon
<	Less-than sign
=	Equals sign
>	Greater-than sign
?	Question mark
_	Underline or low line
	space

Next Data Entry Field, Select Command Example

This example shows how to define a label with four human-readable fields.

If you do not specify the field to which data is assigned, the printer automatically assigns that data to the lowest numbered field. In this example, the field is not specified, so the printer assigns the first data st field 2, and so on. The data strings are separated by the Next Data Entry Field, Select command (syntax <CR>).

```
FIRST FIELD
     SECOND FIELD
          THIRD FIELD
               FOURTH FIELD
```

Command String	Definition
<STX><ESC>P;E6;F6<ETX>	Places the printer in Program mode, erases current format 6, and creates a new format 6.
<STX>H0;o100,100;d0,20<ETX>	Changes the default settings for field 0: places the origin at 200,50, and specifies that data for this field will be transmitted when the printer is in Print mode. All other field settings are defaults.
<STX>H1;o200,200;d0,20<ETX>	Defines a human-readable field at origin 200,200. All other settings are identical to H0.
<STX>H2;o300,300;d0,20<ETX>	Defines a human-readable field at origin 300,300. All other settings are identical to H0.
<STX>H3;o400,400;d0,20<ETX>	Defines a human-readable field at origin 400,400. All other settings are identical to H0.
<STX>R<ESC>E6<CAN><ETX>	Places the printer in Print mode, selects format 6, and clears all previous data.
<STX>FIRST FIELD<CR> SECOND FIELD<CR> THIRD FIELD<CR> FOURTH FIELD<ETX>	Specifies the data to be assigned to the four fields requiring input. <CR> separates the individual data strings. The first data string (FIRST FIELD) is assigned to field 0, the second (SECOND FIELD) to field 1, and so on.
<STX><ETB><ETX>	Prints the label.

Advanced Mode, Select

Purpose

Instructs the printer to operate in Advanced mode. Advanced mode is the default mode; the alternative operating mode is [Emulation mode](#).

Supported Printers

All

Syntax

<ESC>C*n*

Parameters

n

Sets the dot size:

n	Size
0	5.0 mil (0.005 inch) dot size . Equals one dot on a 200 dpi printhead. (default)
1	2.5 mil (0.0025 inch) dot size. Equals one dot on a 400 dpi printhead.

Program Mode, Enter

Purpose

Causes the printer to enter Program mode for the purpose of creating or editing pages, formats, fonts, or graphics.

Supported Printers

All

Syntax

<ESC>P

Note: *When this command is executed, all previously entered data is lost.*

Hardware Configuration Label, Print

Purpose

Prints a label that provides information about the printer's hardware configuration.

Supported Printers

All

Syntax

h

Format, Select

Purpose

Selects a format for data entry or printing.

For RFID tags: If you have fixed data, this command writes to the RFID tag.

Supported Printers

All

Syntax

<ESC>E*n*

Parameters

n

Numeric format ID. If you use an asterisk (*) for the label format, the printer temporarily stores the label format in RAM.

Range: 0 to 99

Default: 0

Note: *If you select a page other than 0, n is an alphabetic format position within the page with a range from a to z.*

After you select the format, the field pointer points to the lowest numbered data entry field.

The printer must be able to completely image a label, within the available number of image bands, for the reimaging command to work and retain the image. The printer starts imaging the label as soon as it receives the command to select a format.

The printer clears all host entered/variable data from this format.

The printer generates an error code (36) if you enter an invalid format number.

Clear All Data

Purpose

Clears all host–entered data from the current page or format.

Supported Printers

All

Syntax

<CAN>

Note: *If you select a format, the pointer indicates the first data entry field in the format after you clear the data. If you select a page, the pointer designates the first data entry field in the first format.*

Next Data Entry Field, Select

Purpose

Moves the field pointer to the next data entry field.

Supported Printers

All

Syntax

<CR>

Note: *If you have not selected a page and the pointer is designating the last field, the field pointer moves back to the first data entry field in the format. If you selected a multi-format page and the field pointer is pointing to the last field in a format, it moves to the first field in the next format.*

Print

Purpose

Prints the current page or format with previously entered data.

Supported Printers

All

Syntax

<ETB>

Lines and Boxes Example

This example uses horizontal lines to separate fields on a label and uses a box field to make a label border. This format uses bold text to highlight the lines that contain line or box fields.

Command Strings

<STX><ESC>C0<ETX>
<STX><ESC>P<ETX>
<STX>E4;F4,DEMO 4<ETX>
<STX>L1;o11,447;f0;l1207;w4<ETX>
<STX>L2;o11,285;f0;l1207;w4<ETX>
<STX>W3;o11,0;f0;l1207;h802;w4<ETX>
<STX>B4;o658,650;f0;h102;w2;c0,0;i1;r1;d0,11<ETX>
<STX>I4;o658,752;f0;h1;w1;c20;r0;b0<ETX>
<STX>B5;o87,650;f0;h102;w2;c0,0;i1;r1;d0,11<ETX>
<STX>I5;o87,752;f0;h1;w1;c20;r0;b0<ETX>
<STX>H6;o34,183;f0;h1;w1;c22;r0;b0;d0,17<ETX>
<STX>H7;o35,143;f0;h1;w1;c21;r0;b0;d3,BASIS WT. 39-4838<ETX>
<STX>H8;o389,305;f0;h1;w1;c21;r0;b0;d3,ROLLS<ETX>
<STX>H9;o40,305;f0;h1;w1;c21;r0;b0;d3,ROLL WIDTH<ETX>
<STX>L10;o11,609;f0;l1207;w4<ETX>
<STX>H12;o1022,508;f0;h1;w1;c22;r0;b0;d0,7<ETX>
<STX>H13;o1022,467;f0;h1;w1;c21;r0;b0;d3,WEIGHT<ETX>
<STX>H14;o539,508;f0;h1;w1;c22;r0;b0;d0,11<ETX>
<STX>H15;o539,467;f0;h1;w1;c21;r0;b0;d3,LOCATION<ETX>
<STX>H16;o42,508;f0;h1;w1;c22;r0;b0;d0,15<ETX>
<STX>H17;o43,467;f0;h1;w1;c21;r0;b0;d3,CUSTOMER ORDER NUMBER<ETX>
<STX>H18;o840,346;f0;h1;w1;c22;r0;b0;d0,13<ETX>
<STX>H19;o840,305;f0;h1;w1;c21;r0;b0;d3,ORDER ITEM NUMBER<ETX>
<STX>H20;o389,346;f0;h1;w1;c22;r0;b0;d0,7<ETX>
<STX>H21;o34,346;f0;h1;w1;c22;r0;b0;d0,11<ETX>
<STX>H22;o747,183;f0;h1;w1;c22;r0;b0;d0,15<ETX>
<STX>H23;o743,143;f0;h1;w1;c21;r0;b0;d3,GRADE DESCRIPTION<ETX>
<STX>H24;o325,0;f0;h51;w34;c25;r0;b3;d3,SHIPPING LABEL<ETX>
<STX>R<ETX>
<STX><ESC>E4<CAN><ETX>
<STX><ESC>F4<LF>Honeywell<ETX>
<STX><ESC>F5<LF>372181192<ETX>
<STX><ESC>F6<LF>38448379237<ETX>
<STX><ESC>F12<LF>230<ETX>
<STX><ESC>F14<LF>3839494<ETX>
<STX><ESC>F16<LF>372181192<ETX>
<STX><ESC>F18<LF>234-LOFT<ETX>
<STX><ESC>F20<LF>12<ETX>
<STX><ESC>F21<LF>338438<ETX>
<STX><ESC>F22<LF>A-PLUS QTY<ETX>
<STX><ETB><FF><ETX>

Graphics and Rotated Fields Example

This complex label includes human–readable fields, a barcode field, line fields, a box field, and a graphic field.
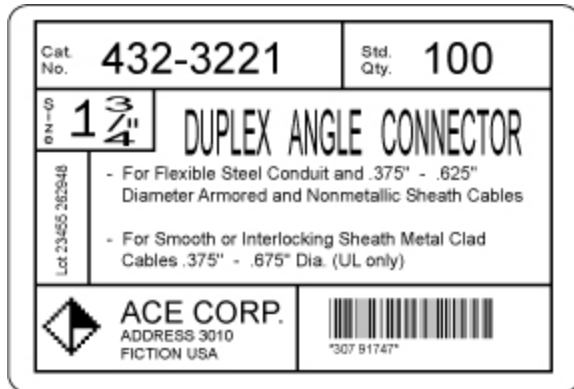
This example uses the "diamond" graphic from the procedure in Creating User–Defined Characters for Advanced Mode. To print this label, you need to follow that procedure to create and download the graphic to your printer beforehand.

Command Strings

```
<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E5;F5<ETX>
<STX>H0;o35,40;c25;d3,Cat.;k12<ETX>
<STX>H1;o35,70;c25;d3,No.;k12<ETX>
<STX>H2;o165,0;c25;d3,432–3221;k36<ETX>
<STX>H3;o785,40;c25;d3,Std.;k12<ETX>
<STX>H4;o785,70;c25;d3,Qty.;k12<ETX>
<STX>H5;o915,0;c25;d3,100;k36<ETX>
<STX>L6;o740,10;f3;l130;w8<ETX>
<STX>L7;o25,140;l1130;w8<ETX>
<STX>H8;o30,165;c25;f3;r1;d3,Size;k12<ETX>
<STX>H9;o80,170;c25;d3,1 ";k30<ETX>
<STX>H10;o150,165;f3;r1;c25;d3,3/4;h3;w7<ETX>
<STX>L11;o300,140;f3;l130;w8<ETX>
<STX>L12;o25,270;l275;w8<ETX>
<STX>H13;o60,560;f1;c25;d0,20;h3;w2<ETX>
<STX>L14;o140,270;f3;l310;w8<ETX>
<STX>H15;o360,120;c22;d3,DUPLEX ANGLE CONNECTOR;h3;w1<ETX>
<STX>H16;o170,320;c25;d3,– For Flexible Steel Conduit and .375" – .625";k12<ETX>
 <STX>H17;o212,375;c25;d3,Diameter Armored and Nonmetallic Sheath
Cables;k12<ETX>
<STX>H18;o170,450;c25;d3,– For Smooth or Interlocking Sheath Metal Clad;k12<ETX>
<STX>H19;o212,505;c25;d3,Cables .375" – .675" Dia. (UL only);k12<ETX>
```

```
<STX>L20;o25,580;l1130;w8<ETX>
<STX>U21;o40,610;c2;h9;w9<ETX>
<STX>H22;o210,600;c25;d3,ACE CORP.;k24<ETX>
<STX>H23;o210,670;c25;d3,ADDRESS 3010;k12<ETX>
<STX>H24;o210,710;c25;d3,FICTION USA;k12<ETX>
<STX>B25;o685,615;c0,0;d0,20;i1;h100;p@<ETX>
<STX>I25;h2;w2<ETX>
<STX>L26;o590,580;f3;l185;w8<ETX>
<STX>W27;o015,000;w10;l1150;h775<ETX>
<STX>R<ETX>
<STX><ESC>E5<CAN><ETX>
<STX>Lot 23455 262948<CR><FS>307 91747<FS><ESC>I2<ETX>
<STX><RS>5<ETB><ETX>
```

Command String Descriptions

Command	Description
<ESC>C	Places the printer in Advanced mode.
<ESC>P	Places the printer in Program mode.
E5;F5	Clears current format 5 and creates a new format 5.
H0;	Defines field 0 as a human-readable field.
o35,40;	Sets the origin of field 0 at 35,40.
c25;	Sets the font for field 0 to font 25.
d3,Cat.;	Sets the data for field 0 to "Cat.".
k12;	Sets the font size to 12.
L6;	Defines field 6 as a line field.
o740,10;	Sets the origin for field 6 at 740,10.
f3;	Rotates field 6 by 270 degrees counterclockwise around the field origin.
l130;	Sets the length of the line in field 6 to 130 dots.
w8;	Sets the width of field 6 to 8 dots.
H8;	Defines field 8 as a human-readable field.
o30,165;	Sets the origin of field 8 at 30,165.
c25;	Defines the font for field 8 as font 25.
f3;	Rotates field 8 by 270 degrees counterclockwise around the origin.
r1;	Rotates the characters in field 8 by 90 degrees counterclockwise.

Command	Description
d3,Size;	Sets the data for field 8 to "Size".
k12;	Sets the font size to 12.
H10;	Defines field 10 as a human-readable field.
o150,165;	Sets the origin for field 10 at 150,165.
f3;	Rotates field 10 by 270 degrees counterclockwise around the origin.
r1;	Rotates the characters in field 10 by 90 degrees counterclockwise.
c25;	Sets the font for field 10 to font 25.
d3,3/4;	Sets the data for field 10 to "3/4".
k12;	Sets the font size to 12.
H13;	Defines field 13 as a human-readable field.
o60,560;	Sets the origin of field 13 at 60,560.
f1;	Rotates field 13 by 90 degrees around the origin.
c25;	Sets the font for field 13 to font 25.
d0,20;	Specifies that data for field 13 is entered during Print mode with a maximum of 20 characters.
k10;	Sets the font size to 10.
U21;	Defines field 21 as a graphic field.
o40,610;	Sets the origin of field 21 at 40,610.
c2;	Specifies that field 21 prints in font 2. In this case, font 2 actually refers to the user-defined graphic ("diamond") previously downloaded to the printer.
h9;	Sets the height to nine times the original size.
w9;	Sets the width to 9 dots.
B25;	Defines field 25 as a barcode field.
o685,615;	Sets the origin of field 25 at 685,615.
c0,0;	Sets the barcode font to Code 39 with no check digit.
d0,20;	Determines that the data for field 25 is entered during Print mode with a maximum of 20 characters.
i1;	Enables the interpretive field for the barcode, to print with start and stop characters included.
h100;	Sets the barcode height to 100 dots.

Command	Description
p@;	Clears all prefixes from the barcode field.
I25	Edits the interpretive field for barcode field 25.
h2	Sets the height of the interpretive field to twice its original height.
w2	Sets the width of the interpretive field to 2 dots.
W27;	Defines field 27 as a box field.
o015,000;	Sets the origin of field 27 at 15,0.
w10;	Defines the line width of the box as 10 dots.
l1150;	Defines the length of the box as 1150.
h775;	Sets the height of the box to 775.
R	Places the printer in Print mode.
<ESC>E5	Accesses format 5 from the printer memory.
<CAN>	Clears all data for the current format and sets the field pointer to the lowest numbered data entry field.
Lot 23455 262948<CR>	This is the data intended for the first data-entry field. <CR> instructs the printer to go to the next data-entry field.
<FS>	Specifies that the following data is to be incremented.
307 91747	This is the data intended for the next data-entry field (specified as data to be incremented).
<FS>	Specifies that the preceding data is to be incremented.
<ESC>I2	The data surrounded by <FS> commands is to be incremented by a value of 2 after each label is printed.
<RS>5	Sets the number of labels to print when the print command is executed.
<ETB>	Prints the label.

RFID Tag Example

This barcode label contains an RFID tag.

Command Strings

<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E4;F4;<ETX>
<STX>H0;o102,51;f0;c25;h20;w20;d0,30;<ETX>
<STX>L1;o102,102;f0;l575;w5;<ETX>
<STX>B2;o203,153;c0,0;h100;w2;i1;d0,10;<ETX>
<STX>I2;h1;w1;c20;<ETX>
<STX>Q3;a2,2,0,23;d3,MY FIRST RFID TAG WRITE;<ETX>
<STX>R;<ETX>
<STX><ESC>E4<ETX>
<STX><CAN><ETX>
<STX>MY FIRST RFID TAG WRITE<CR><ETX>
<STX>SAMPLE<ETX>
<STX><ESC>J2,2,0,23<ETX>
<STX><ETB><ETX>

Command String Descriptions

Command	Description
<ESC>C	Places the printer in Advanced mode.
<ESC>P	Places the printer in Program mode.
E4;F4	Clears current format 4 and creates a new format 4.
H0	Defines field 0 as a human-readable field.
o102,51	Sets the origin of field 0 at coordinates 102,51.
f0	Rotates field 0 by 0 degrees.

Command	Description
c25	Sets the font to font 25.
h20	Sets the height to 20 times original size.
w20	Sets the width to 20 times original size.
d0,30	Specifies that data for this field is transmitted in Print mode with a maximum of 30 characters.
L1	Defines field 1 as a line field.
o102,102	Sets the origin of field 1 at coordinates 102,102.
f0	Rotates field 1 by 90 degrees counterclockwise around the origin.
l575	Defines the length of the line as 575.
w5	Sets the width of the line to 5 dots.
B2	Defines field 2 as a barcode field.
o203,153	Sets the origin of field 2 at coordinates 203,153.
c0,0	Sets the barcode font to Code 39 with no check digit.
h100	Sets the height to 100 dots.
w2	Sets the width to 2 dots.
i1	Enables the interpretive field, to print with start and stop characters included.
d0,10	Specifies that data for this field is transmitted in Print mode with a maximum of 10 characters.
I2	Edits the interpretive field for barcode field 2.
h1	Sets the height to original size.
w1	Sets the width to original size.
c20	Sets the font to font 20.
Q3	Defines field 3 as an RFID field.
a2,2,0,23	Sets the format to ASCII, writes to the Data segment, starts on byte 0 and writes up to 23 bytes.
d3,MY FIRST RFID TAG WRITE	Defines constant data for field 3 to be "MY FIRST RFID TAG WRITE."
R	Places the printer in Print mode.
<ESC>E4	Accesses format 4 from the printer memory.

Command	Description
<CAN>	Clears all data for format 4 and sets the field pointer to the lowest numbered data-entry field.
MY FIRST RFID TAG WRITE<CR>	This is the data intended for the first data-entry field (human-read-able field 0). <CR> instructs the printer to go to the next data-entry field.
SAMPLE	This is the data intended for the second data-entry field (barcode field 2).
<ESC>J2,2,0 ,23	Reads the data from the RFID tag. The data is in ASCII format on the Data segment, starting on byte 0 and having a length of 23 bytes.
<ETB>	Prints the label.

Numeric Field Separator

Purpose

Specifies which numeric data within a field to increment or decrement.

Supported Printers

All

Syntax

You must enclose the data between two sets of <FS> commands:

<FS>*data*<FS>

Note: *You can have more than one region per field as long as they do not overlap. The printer independently increments or decrements each region according to the increment or decrement value specified for the field. The length of data does not change. Instead, the values increment or decrement as in an odometer: 9 increments to 0. The printer ignores any non-numeric characters within the region.*

Example

```
<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E1;F1;<ETX>
<STX>H1;o175,10;f3;c2;h2;w2;b10;<ETX>
<STX>H2;o75,10;f3;c2;h2;w2;b10;<ETX>
<STX>H3;o200,10;f3;c7;h2;w2<ETX>
<STX>H4;o100,10;f3;c7;h2;w2<ETX>
<STX>R<ETX>
<STX><ESC>E1<CAN><ETX>
<STX><CR><ESC>I1<FS>1<FS><ETX>
<STX><CR><ESC>D1<FS>10<FS><ETX>
<STX><CR>Increment Field<ETX>
<STX><CR>Decrement Field<ETX>
<STX><RS>3<ETB><ETX>
```

Field Increment, Set

Purpose

Sets the increment value for the selected field.

Supported Printers

All

Syntax

<ESC>I*n*

Parameters

n

Increment value.

Range: 1 to 9999

Default: 1

The printer generates an [error code (22)](#) if the increment value is out of range.

Note: *In the section of data separated by <FS> or <GS>, the printer increments the values in data entry fields by n after it prints each batch. You must use this command when you define a format in Programming mode.*

Example

```
<STX><ESC>E5<CAN><ETX>
<STX>Lot 23455 262948<CR><FS>3O7 91747<FS><ESC>I2<ETX>
<STX><RS>5<ETB><ETX>
```

Quantity Count, Set

Purpose

Sets the quantity of label batches to be printed by the next print command.

Supported Printers

All

Syntax

<RS>*n*

Parameters

n

Number of batches.

Range: 1 to 9999

Default: 1

Note: *The printer generates an error code (21) if the quantity is out of range.*

Data increments or decrements between batches of labels.

Example

<STX><RS>5<ETB><ETX>

How to Work with Fonts and Graphics

The printers come installed with several TrueType® fonts and some bitmap fonts. Although both bitmap and TrueType fonts are supported, Honeywell recommends using TrueType fonts. You can also download OpenType® fonts based on TrueType fonts to the printer.

Use these topics to learn how to use fonts and graphics with your printer.

Download Fonts to the Printer

About Asian Fonts

How to Create User-Defined Characters and Fonts

Replace an Existing Font Using Font Aliasing

Transfer Graphics to the Printer

You can transfer graphics to the printer without having to use a printer–specific format using the printer web page, a USB storage device, or FTP. The printers will print .bmp, .pcx, or .png files of one-bit depth.

Here is the basic process for transferring graphics:

1. [Rename your files](#) to UDC<ID>.LOGO.

2. Transfer the renamed files using the [printer web page](#), a [USB storage device](#), or [FTP](#).

3. You can verify that the graphics transferred correctly by viewing them on the printer web page, through FTP, or by sending this IPL command to the printer: <STX><ESC>u<ETX>

About Emulation Mode

Emulation mode lets you print barcode labels that were designed on an 86XX printer in multiples of 10 or 15 mil.

"Emulation mode" is also called "86XX Emulation mode" in some printer manuals.

In Emulation mode:

- pages are not available.
- character size is specified by height and width magnification only.
- international characters are preceded by <SUB> or selectable by language.
- the bitmaps for user-defined characters (UDC) and user-defined fonts (UDF) are one bit per byte (instead of six bits per byte).
- print resolution is in 10 mil dots.
- RFID commands are not available.

These IPL commands place the printer in Emulation mode:

Emulation or Advanced Mode on Power-Up

Emulation Mode, Enter

This table lists the IPL commands that work when the printer is in Emulation mode.

Command	Syntax
Abort Print Job	<EM>
Advanced Mode, Select	<ESC>C
Alphanumeric Field Separator	<GS>
Barcode, Select Type	c
Barcode Field, Create or Edit	B
Batch Count, Set	<US>
Bitmap Cell Height for Graphic or UDF, Define	y
Bitmap Cell Width for Graphic or UDF, Define	x
Bitmap User-Defined Font, Clear or Define	T
Border Around Human-Readable Text, Define	b
Box Field, Create or Edit	W
Character Bitmap Origin Offset, Define	X
Character Rotation or Barcode Ratio, Define	r
Clear All Data	<CAN>

Command	Syntax
Clear Data From Current Field	<DEL>
Command Terminator	;
Command Terminator 1	<NUL>
Configuration Parameters, Transmit	<ESC>p
Control Panel Access Permission, Set	<SI>A
Cut	<SO>
Cutter, Enable or Disable	<SI>c
Dark Adjust	K
Dark Adjust, Set	Set <SI>d
Data Shift – International Characters	<SUB>
Data Source for Format in a Page, Define	e
Emulation Mode, Enter	<ESC>c
Emulation or Advanced Mode on Power-Up	<SI>C
End-of-Print Skip Distance, Set	<SI>D
Error Code, Request	<BEL>
Factory Defaults, Reset	D
Field, Delete	D
Field, Select	<ESC>F
Field Data, Define Source	d
Field Decrement, Set	<ESC>D
Field Direction, Define	f
Field Increment, Set	<ESC>I
Field Origin, Define	o
First Data Entry Field, Select	<ACK>
Font, Transmit	<ESC>v
Font Character Width, Define	Z
Font Type, Select	c
Form Feed	<FF>
Format, Create or Edit	A or F
Format, Erase	E

Command	Syntax
Format, Select	<ESC>E
Format, Transmit	<ESC>x
Format Direction in a Page, Define	q
Format Offset Within a Page, Define	O
Format Position From Page, Delete	m
Format Position in a Page, Assign	M
Formats, Print	f
Graphic, Select	c
Graphic or UDC, Define	u
Hardware Configuration Label, Print	h
Height Magnification of Bar, Box, or UDC, Define	h
Human–Readable Field, Create or Edit	H
Increment and Decrement, Disable	<ESC>N
Intercharacter Space for UDF, Define	z
Interpretive Field, Edit	I
Interpretive Field, Enable or Disable	I
Label and Gap Length, Transmit	<ESC> L
Label Rest Point, Adjust	<SI>f
Label Retract, Enable or Disable	<SI>R
Label Retract Distance, Set	<SI>r
Label Stock Type, Select	<SI>T
Length of Line or Box Field, Define	l
Line Field, Create or Edit	L
Maximum Label Length, Set	<SI>L
Media Fault Recovery Mode, Set	<SI>e
Media Sensitivity, Select	<SI>g
Memory Usage, Transmit	<ESC>m
Next Data Entry Field, Select	<CR>
Numeric Field Separator	<FS>
Options Selected, Transmit	<ESC>O

Command	Syntax
Page, Create or Edit	S
Page, Delete	s
Page, Select	<ESC>G
Page, Transmit	<ESC>y
Pages, Print	p
Point Size, Set	k
Postamble, Set	<EOT>
Preamble, Set	<SOH>
Print	<ETB>
Print Quality Label, Print	Q
Print Speed, Set	<SI>S
Printer Language, Select	<SI>l
Printhead Loading Mode, Select	<SI>h
Printhead Parameters, Transmit	<ESC>H
Program Mode, Enter	<ESC>P
Program Mode, Exit	R
Version Number, Transmit	<ESC>M
Quantity Count, Set	<RS>
Remaining Quantity and Batch Count, Transmit	<ESC>Q
Reset	<DLE>
Self-Strip, Enable or Disable	<SI>t
Slash Zero, Enable or Disable	<SI>z
Software Configuration Label, Print	s
Start and Stop Codes (Code 39), Print	<ESC><SP>
Status Dump	<VT>
Status Enquiry	<ENQ>
Test and Service Mode, Enter	<ESC>T
Test and Service Mode, Exit	R
Top of Form, Set	<SI>F
User-Defined Characters (UDC) and Graphics, Print	g

Command	Syntax
User–Defined Character, Clear or Create	G
User–Defined Character Field, Create or Edit	U
User–Defined Characters, Transmit	<ESC>u
User–Defined Font Character, Create	t
Warm Boot	<BS>

Emulation or Advanced Mode on Power-Up

Purpose

Selects Legacy Emulation printer operating mode or Advanced mode on power-up.

If you cannot print Code 39 labels designed for an 86XX printer, use this command to place the printer in Legacy Emulation mode:

- Print resolution in 10 mil dots for Emulation mode.
- Data shift in Emulation mode. International characters are preceded by <SUB> or selectable by language.
- One bit per byte format in Emulation mode.

Supported Printers

All printers with a 200 dpi or 400 dpi printhead.

Syntax

<SI>C*n*[,*m*]

Parameters

n

Specifies the mode:

n	Description
0	Emulation mode (10 mil)
1	Advanced mode (5 mil) (default)
3	Advanced mode (2.5 mil, for 400 dpi printhead, only)

m

Enables or disables Legacy Emulation mode:

m	Description
0	Disables Legacy mode on the next reboot.
1	Enables Legacy mode on the next reboot.

Note: *Emulation mode lets you print labels that were designed on an 86XX printer in multiples of 10 mil.*

Ten mils is:

- 2 dots for a 200 dpi printer.

- 4 dots for a 400 dpi printer.

See Also:

[Advanced Mode, Select](#)

[Emulation Mode, Enter](#)

802.11 Security Type, Set

Purpose

Sets the type of network authentication on the printer.

Supported Printers

All

Syntax

<SI>ws,SECURITY TYPE,*n*

Parameters

n

Value:

- None
- WEP (static)
- Pre-Shared Key
- PEAP
- TLS
- TTLS
- LEAP
- EAP-FAST

802.11 Security Type, Transmit

Purpose

Transmits the current network authentication value.

Supported Printers

All

Syntax

<SI>wt,SECURITY TYPE

See Also:

[802.11 Security Type, Set](#)

Abort Print Job

Purpose

Stops batch printing.

Supported Printers

All

Syntax

<EM>

Note: *The printer stops the current batch print job. The batch quantity count is reset to the original setting. The printer continues to execute other commands remaining in the buffer.*

Access Point Information Transmit

Purpose

Transmits the current MAC address of the access point that the printer is currently associated with.

Supported Printers

All

Syntax

<SI>wt,ACCESS POINT MAC

Yields the MAC address of the associated access point. If there is no association, this command yields "00:00:00:00:00:00:".

Acquire PAC, Set

Purpose

Specifies the PAC (Protected Access Credential) file used by EAP–FAST authentication. Setting is only used when ASSOCIATION is set to EAP–FAST.

Supported Printers

All

Syntax

<SI>ws,ACQUIRE PAC,*<sexp>*

Parameters

<sexp>

Is either ON or OFF.

Default: ON

Note: *Setting is checked only if the current PAC fails authentication.*

The installed ACQUIRE PAC value appears on the network test label only if the printer is using 802.1x security.

Acquire PAC, Transmit

Purpose

Checks if automatic PAC (Protected Access Credential) file provisioning is enabled. This setting also allows automatic setting of the PAC value after automatic provision succeeds. Setting is only used when ASSOCIATION is set to EAP-FAST.

Supported Printers

All

Syntax

<SI>wt,ACQUIRE PAC

Note: *The current ACQUIRE PAC value is either ON (default) or OFF.*

Active Channel, Set

Purpose

Sets the active channel. 802.11 b/g/n operates on a number of different channels corresponding to different frequencies. Setting the CHANNEL is supported only when NETWORK TYPE is set to Ad Hoc. Available channels are dependent on the current Country or Region setting.

Supported Printers

All

Syntax

<SI>ws,CHANNEL,*n*

Parameters

n

Sets the active channel.

Values: 1 to 14 (If the channel is 0, an association has not yet been made.)

Active Channel, Transmit

Purpose

Transmits the current channel. 802.11 b/g operates on a number of different channels, corresponding to different frequencies. The printer scans for a suitable access point and channel. The selected channel can be read from the printer.

Supported Printers

PAll

Syntax

<SI>wt,CHANNEL

Yields one of these values:

Value	Description
0	There is currently no association.
1 to 14	The currently selected channel. The range of allowed channels is determined by the Region setting.

All Bluetooth Settings, Transmit

Purpose

Transmits all the printer's Bluetooth settings, except the passkey, to the host device.

Supported Printers

All

Syntax

\<SI>Bt

Yields all the printer's Bluetooth settings, except the passkey.

All Settings, Transmit (Wireless LAN or 802.1x)

Purpose

Transmits all of the printer's Wireless LAN or 802.1x settings to the host device.

Supported Printers

All

Syntax

<SI>wt

Alphanumeric Field Separator

Purpose

Increments or decrements alphanumeric characters within a field–separated region. You must enclose the data between two sets of <GS> commands:

<GS>*data*<GS>

Supported Printers

All

Syntax

<GS>

Alphanumeric characters are 0 to 9 and A to Z. The order of the characters is 0, 1, 2...8, 9, A, B, C...Y, Z, 0, 1...9, A, B....

Note: *You may have more than one region in a field as long as they do not overlap. Each region independently increments or decrements according to the increment or decrement value specified for the field. The length of data does not change. Instead, the values increment or decrement as in an odometer. For example, 9 increments to 0, and Z increments to A.*

This command marks the region of characters to increment or decrement, but it does not actually increment or decrement. The printer ignores any non–alphanumeric characters within this region.

Example

```
<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E1;F1;<ETX>
<STX>H1;o175,10;f3;c2;h2;w2;b10;<ETX>
<STX>H2;o75,10;f3;c2;h2;w2;b10;<ETX>
<STX>H3;o200,10;f3;c7;h2;w2<ETX>
<STX>H4;o100,10;f3;c7;h2;w2<ETX>
<STX>R<ETX>
<STX><ESC>E1<CAN><ETX>
<STX><CR><ESC>I1<GS>A<GS><ETX>
<STX><CR><ESC>D1<GS>C<GS><ETX>
<STX><CR>Increment Field<ETX>
<STX><CR>Decrement Field<ETX>
<STX><RS>3<ETB><ETX>
```

Anonymous Name, Set

Purpose

Anonymous Name is a "dummy" name used to protect the true supplicant EAP identity. The "dummy" name has nothing to do with the actual user name. The true user name is supplied later in the data exchange and is encrypted to prevent security attacks. You use the anonymous name to log in to the network.

Supported Printers

All

Syntax

<SI>ws,ANONYMOUS NAME,*n*

Parameters

n

Values: Up to 96 characters. Honeywell recommends setting a user name that is longer than 8 characters.

Default: null

Anonymous Name, Transmit

Purpose

Transmits the TTLS (Tunneled Transport Layer Security) user name, also known as the Anonymous Name, used to log in to the network.

Supported Printers

All

Syntax

<SI>wt,ANONYMOUS NAME

Yields the current TTLS user name.

Default: null

Association, Set

Purpose

Sets the association type to use for network authentication, which is the security method the printer uses to grant access to the wireless network. You can use OPEN/WEP, SHARED/WEP, WPA/TKIP, or WPA2/AES security.

Supported Printers

All

Syntax

<SI>ws,ASSOCIATION,*n*

Parameters

n

Value:

- OPEN/WEP
- SHARED/WEP
- WPA/WPA2 Mixed
- WPA2/AES

Association, Transmit

Purpose

Transmits the EAP (Extensible Authentication Protocol) currently used for 802.1x authentication.

Supported Printers

All

Syntax

<SI>wt,ASSOCIATION

Auto-Transmit 1, Enable

Purpose

Enables auto-transmit level 1.

Supported Printers

All

Syntax

<ESC>j

Note: *The printer uploads the status in this order of priority for Honeywell Standard Protocol and XON/XOFF with Status:*

Status	Standard Text	Standard Hex	XON/XOFF with Status Text	XON/XOFF with Status Hex
Label at strip pin	<FS>	1C	<FS>	1C
No label stock	<EM>	19	<EM>	19
Ribbon fault	<US>	1F	<US>	1F
Label path open	<US>	1F	<US>	1F
Fault cleared	<DC1>	11	<DC2>	12

Auto-Transmit 2, Enable

Purpose

Enables auto-transmit level 2.

Supported Printers

All

Syntax

<ESC>d

Note: *The printer uploads the status in this order of priority for Honeywell Standard Protocol and XON/XOFF with Status:*

Status	Standard Text	Standard Hex	XON/XOFF with Status Text	XON/XOFF with Status Hex
Buffer is not full	<DC1>	11	<DC2>	12

Auto-Transmit 3, Enable

Purpose

Enables auto-transmit level 3.

Supported Printers

All

Syntax

<ESC>e

Note: The printer uploads the status in this order of priority for Honeywell Standard Protocol and XON/XOFF with Status:

Status	Standard Text	Standard Hex	XON/XOFF with Status Text	XON/XOFF with Status Hex
RFID tag write successful	<ACK>	06	<ACK>	06
RFID tag write error	<EOT>	04	<EOT>	04
Imager overrun	N/A	N/A	N/A	N/A
Printing is complete and the buffer is empty	<SOH>	01	<SOH>	01
Insufficient RAM for printing or storage	<RS>	1E	<RS>	1E
RFID tag read error	<VT>	0B	<VT>	0B

Auto-Transmit 1, 2, and 3, Disable

Purpose

Disables the auto-transmit status responses.

Supported Printers

All

Syntax

<ESC>k

Note: *If auto-transmit is not enabled, the host must use the* Status Enquiry <ENQ> *or* Status Dump <VT> *command to determine the status.*

Batch Count, Set

Purpose

Sets the number of labels to be printed in the next batch.

Supported Printers

All

Syntax

<US>*n*

Parameters

n

Number of labels to be printed in the next batch.

Range: 1 to 9999

Default: 1

Note: *This command causes the printer to make n copies of the same label. The total number of labels printed per print command is equal to the quantity in each batch multiplied by the number of batches.*

The printer generates an error code (21) if *n* is out of range.

Battery Low Voltage Threshold, Set

Purpose

Sets the low voltage threshold for the battery.

Supported Printers

PC23d, PC43d, PC43t

Syntax

<SI>V*n*

Parameters

n

Range: 0 to 16.8

Default: 13.5

Battery Status and Information, Transmit

Purpose

Transmits the current battery status, battery charging status, or numeric threshold value of the printer to the host device.

Supported Printers

PC23d, PC43d, PC43t

Syntax

<ESC>V*n*

Parameters

n
Values for *n* are:

n	Information Transmitted
1	Current battery status: 0 = Battery has correct voltage 1 = Battery is below low battery indicator setting 2 = Battery is above maximum voltage 3 = Battery is below minimum voltage 4 = Battery is not installed
2	Current battery charging status: 0 = Not charging 1 = Charging complete (external power connected) 2 = Charging in process (external power connected) 3 = Charging error (external power connected)
3	Numeric value of the current threshold

Certificate Authority, Set

Purpose

Sets the name of the CA (certificate authority) that verifies the server certificate. This CA should be the same as the one used to sign the server certificate.

This command is only used when [ASSOCIATION](#) is set to either TTLS or PEAP. To reinstall the default root CA certificate, set an empty string as the CA Certificate.

Supported Printers

All

Syntax

<SI>ws,CA CERTIFICATE,*n*

Parameters

n

where *n* is a valid CA certificate path value.

Default: Honeywell.pem

Note: *Installed certificates are converted to DER (Distinguished Encoding Rules) format and copied to /c/ADMIN/root.cer.*

To reinstall the default root CA certificate, install the certificate "/rom/Honeywell.cer" or remove the /c/ADMIN/root.cer file.

Some certificate formats, such as PKCS#12, use a pass phrase to encrypt data. To import certificates that include anything other than an empty pass phrase, you need to add @ and the passphrase to the CA certificate path. For example, this syntax sets the CA certificate to use the path /tmp/mycert.cer and the pass phrase "verysecret":

<SI>ws,CA CERTIFICATE,/tmp/mycert.cer@verysecret

The passphrase used to decrypt the certificate is only used during the certification installation and is not stored on the printer.

Certificate Authority, Transmit

Purpose

Transmits the CA (certificate authority) certificate that the printer is using.

This command is only used when ASSOCIATION is set to either TTLS or PEAP. Selecting another Association type disables this command but does not erase the settings.

Supported Printers

All

Syntax

<SI>wt,CA CERTIFICATE

Yields the current CA certificate common name.

Default: Honeywell.pem

Change Password

Purpose

To change the password for a user in IPL.

Supported Printers

All

Syntax

<SI>xp,user,oldpass,newpass,retyped

Note: *If the current password (**oldpass**) is correctly typed, the password is changed to **newpass**. The new password must be entered twice to avoid typing errors. The new password's total length must be less than 128 characters. Numbers, uppercase letters, and metacharacters are encouraged. Comma signs (,) are not allowed.*

Valid user names are **admin** and **user**. Everyone can become **user** even if user's password is set.

Example

This example changes the password from "pass" to "?pw":

<STX><SI>xp,admin,pass,?pw,?pw<ETX>

Change User

Purpose

To change the current user in IPL. The change user command switches to the specified user after checking the password against the password file.

Supported Printers

All

Syntax

<SI>xu,user,password

Note: *Valid user names are **admin** and **user**. Everyone can become **user** without specifying a password.*

Example

This example changes the current user to admin, if the admin's password is "pass":

<STX><SI>xu,admin,pass<ETX>

Clear Data From Current Field

Purpose

Deletes data from the current field.

Supported Printers

All

Syntax

<DEL>

Note: *The field pointer continues to designate the current field even after you clear the data.*

Client Key, Set

Purpose

Sets the private key the printer uses for EAP-TLS.

Supported Printers

All

Syntax

<SI>ws,CLIENT KEY,*n*

Parameters

n

Use the certinstall.sh script to install the certificate correctly. Set the Client Key to an empty string to clear the assigned value.

Values: Up to 128 characters.

Client Key, Transmit

Purpose

Transmits the private key the printer uses for EAP-TLS.

Supported Printers

All

Syntax

<SI>wt,CLIENT KEY

Command Terminator

Purpose

All commands in [Test and Service mode](#), except for the last command in a message, must end with the command terminator.

Supported Printers

All

Syntax

;

Command Terminator 1

Purpose

Terminates the current command.

Supported Printers

All

Syntax

<NUL>

Command Terminator 2

Purpose

Terminates the current command.

Supported Printers

All

Syntax

<LF>

Communication Port Configuration, Set

Purpose

Sets the serial and parallel port configuration.

Supported Printers

All

Syntax

<SI>P[*n1*[, *n2*[, *n3*[, *n4*]]]]

Parameters

n4

Sets the protocol:

n4	Protocol
1	XON/XOFF with status
2	Standard
3	Not used
4	Disable status response protocols

Note: *Parameters n1, n2, and n3 are ignored.*

When n = 1, the XON/XOFF Enabled/Disabled status is not affected.

Configuration Parameters, Transmit

Purpose

Uploads the current configuration commands from the printer. Use this command to view, edit, or copy the current configuration command settings.

Supported Printers

All

Syntax

<ESC>p

Note: *The printer transmits only the configuration parameters that you can set from the host. For a list of the configuration parameters that the printer uploads to the host, see your printer user manual.*

Control Panel Access Permission, Set

Purpose

Sets a security level to restrict access to certain menus.

Supported Printers

All

Syntax

<SI>A*n*

Parameters

n

For all printers, *n* specifies the menus that you can access:

n	Description
0	Allows access to all menus: operator, configuration, installation, and test and service. (default)
1	Allows access to the operator and configuration menus only.
2	Allows access to the operator menu only.
3	Denies access to all menus.

Cut

Purpose

Advances the label out to the cutter and cuts the label stock.

Supported Printers

All

Syntax

<SO>

Note: *This command is executed only if the cutter is installed but not enabled. Use this command only after you print a batch of labels.*

Cutter, Enable or Disable

Purpose

Turns the cutter on or off (if the cutter option is installed). Reset the printer after sending this command.

Supported Printers

All

Syntax

<SI>c*n*

Parameters

n

Enables or disables the cutter:

n	Description
0	Disables the cutter (default)
1	Enables the cutter

Dark Adjust

Purpose

This command changes the darkness of the print on your labels. It is for fine-tuning only.

Supported Printers

All

Syntax

K

Dark Adjust, Set

Purpose

Sets the dark adjust command. This command controls the print darkness on the labels.

Supported Printers

All

Syntax

<SI>d*n*

Parameters

n

Specifies the darkness setting.

Range: –10 (lightest) to +10 (darkest) in increments of 1

Default: 0

Data Shift – International Characters

Purpose

Allows you to enter selected command characters as data.

Supported Printers

All

Syntax

<SUB> or <DLE>

Note: *In Emulation mode, this command shifts the next character (if not a control character) into the upper character bank (setting the eighth bit to 1) to print international characters.*

This command lets you enter selected command characters as data instead of commands in both Advanced and Emulation mode. For example, use this command to enter a <GS> or <CR> as data in a barcode or text field.

Use <SUB> to send these command characters as data:

<ACK>	<DC4>	<FF>	<NUL>	<SYN>
<BEL>	<EM>	<FS>	<RS>	<US>
<BS>	<ENQ>	<GS>	<SI>	<VT>
<CAN>	<EOT>	<HT>	<SO>	
<CR>	<ESC>	<LF>	<SOH>	
<DC2>	<ETB>	<NAK>	<SUB>	

Use <DLE> to send these command characters as data:

<DC1>	<DC3>	<STX>	<ETX>

To send <DLE> as data, preface it with the command <SUB><DLE>.

Example

This example illustrates using the Data Shift command to print control or command characters in a data field:

<STX<ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E1;F1;<ETX>
<STX>H0;o750,10;f3;c0;h3;w2;b10;d0,50<ETX>
<STX>B1;o300,10;f3;c0;h200;w1;i1;r2<ETX>
<STX>B2;o600,10;f3;c0;h200;w1;i1;r2<ETX>
<STX>I1;o75,10;f3;c0;h3;w3<ETX>

<STX>I2;o375,10;f3;c0;h3;w3<ETX>
<STX>R<ETX>
<STX><ESC>E1<ETX>
<STX><CAN><ETX>
<STX>Example for printing control codes<CR><ETX>
<STX><SUB><NUL><SUB><SOH><DLE><STX><DLE><ETX><SUB><EOT>
 <SUB><ENQ><SUB><ACK><SUB><BEL><SUB><BS><SUB><HT><SUB><LF>
<SUB><VT><SUB><FF><SUB><CR><SUB><SO><SUB><SI>
 <SUB><DLE><DLE>
<SUB><DC1><SUB><DC2><ETX>
<STX><CR><ETX>
<STX><SUB><DC3><SUB><DC4><SUB><NAK><SUB><SYN><SUB><ETB>
 <SUB><CAN><SUB><EM><SUB><SUB><SUB>
<ESC><SUB><FS><SUB><GS><SUB><RS><SUB><US><ETX>
<STX><US>1<ETX>
<STX><RS>1<ETX>
<STX><ETB><ETX>

Date or Time, Set

Purpose

Sets the date or time for the real–time clock.

Supported Printers

All

Syntax

<SI>q[*m1*],*m2*

Parameters

m1

Determines whether *m2* sets the date or the time:

m1	Description
0	*m2* sets the date.
1	*m2* sets the time.

m2

Numeric string setting the date or time. There is no default for *m2*. If *m2* is missing from the command or incorrectly formatted, the real–time clock in the printer is not changed.

To set the date, the format for *m2* is YYMMDD:

Digits	Description
YY	Last two digits in the current year. Range: 00 to 99.
MM	Current month. Range: 01 to 12.
DD	Current day. Range: 01 to 31.

To set the time, the format for *m2* is HHMMSS:

Digits	Description
HH	Hour. Range: 00 to 23.
MM	Minute. Range: 00 to 59.
SS	Second. Range: 00 to 59.

Note: *The default date is 800101 and the default time is 000000.*

If the [Field Data, Define Source command](#) is configure to use the date or time from the real time clock, you can use the m1 parameter to change the date and time format.

Date or Time, Transmit

Purpose

Transmits the date or time based on the real–time clock in the printer.

Supported Printers

All

Syntax

<ESC>q[*n*]

Parameters

n

Transmits the date or the time:

n	Description
0	Transmits the date in the format YYMMDD. (default)
1	Transmits the time in the format HHMMSS.

Device Address, Transmit

Purpose

Transmits the device address of the printer's Bluetooth radio to the host device. The device name is a 16-character name you can assign to easily identify the printer.

Supported Printers

All

Syntax

\<SI>Bt,DEVICE ADDRESS

Yields the device address of the printer's Bluetooth radio in this format:

aa:*bb*:*cc*:*dd*:*ee*:*ff*

Device Name, Set

Purpose

Sets the Bluetooth device name of the printer. The device name is a 16-character name you can assign to easily identify the printer.

Supported Printers

All

Syntax

<SI>Bs,DEVICE NAME,*s..s*

Parameters

s..s
where *s..s* = 16 printable characters.

Device Name, Transmit

Purpose

Transmits the Bluetooth device name of the printer to the host device. The device name is a 16-character name you can assign to easily identify the printer.

Supported Printers

All

Syntax

<SI>Bt,DEVICE NAME

Yields the 16-character name assigned to the printer so that it can be easily identified.

Default: Modelnumber+Serialnumber

Direct Graphics Emulation Mode, Enable or Disable

Purpose

Prints direct graphics with the same origin offset as a specific legacy printer.

Supported Printers

All

Syntax

<SI>o*n*

Parameters

n

Enables or disables the emulation mode:

n	Mode
0	Emulate 7421 printer (default).
1	Direct graphics origin is the same as the format's origin.

Discoverable State, Set

Purpose

Sets the Bluetooth discoverable state of the printer. When the discoverable state is enabled, other Bluetooth devices can find the printer during a device discovery. To connect to another Bluetooth device, the printer must also be connectable.

Supported Printers

All

Syntax

<SI>Bs,DISCOVER,*n*

Parameters

n

Values for *n* are:

n	Description
0	Disables the discoverable state
1	Enables the discoverable state

Discoverable State, Transmit

Purpose

Transmits the Bluetooth discoverable state of the printer to the host device. When the discoverable state is enabled, other Bluetooth devices can find the printer during a device discovery. To connect to another Bluetooth device, the printer must also be connectable.

Supported Printers

All

Syntax

<SI>Bt,DISCOVER

Yields one of these values:

Value	Description
0	Discoverable state disabled
1	Discoverable state enabled

Display Current User

Purpose

Displays who the current user is in IPL.

Supported Printers

All

Syntax

.x,whoami

Example

<STX><ESC>.x,whoami<ETX>

Emulation Mode, Enter

Purpose

Instructs the printer to operate in Emulation mode. The default printer mode is [Advanced mode](#).

Supported Printers

All

Syntax

<ESC>c

Note: *Emulation mode lets you print barcode labels that were designed on an 86XX printer in multiples of 10 mil.*

The field pointer designates the first field in format 0.

If the [Page, Select](#) command is disabled, all data previously entered by the host is lost.

Ten mils is:

- 2 dots for a 200 dpi printer.
- 3 dots for a 300 dpi printer.
- 4 dots for a 400 dpi printer.

See Also:

[Emulation or Advanced Mode on Power-Up](#)

[Using Secondary Printer Modes](#)

Encryption, Set

Purpose

Enables or disables Bluetooth data encryption on the printer. Encryption prevents the data from being interpreted by another host device.

When encryption is enabled, authentication is automatically enabled too.

Supported Printers

All

Syntax

<SI>Bs,ENCRYPT,*n*

Parameters

n

Values for *n* are:

n	Description
0	No encryption (default)
1	Enable encryption

Encryption, Transmit

Purpose

Transmits the Bluetooth encryption status of the printer to the host device.

Supported Printers

All

Syntax

<SI>Bt,ENCRYPT

Yields one of these values:

Value	Description
0	No encryption
1	Encryption enabled

End-of-Print Skip Distance, Set

Purpose

Sets the end-of-print skip distance. This distance is a value in 5 mil increments that the label advances after printing or when you pause printing.

Supported Printers

All

Syntax

<SI>D[*n*]

Parameters

n

End-of-print skip distance in 5 mil increments.

Range: 0 to 9999

For 400 dpi printers, 5 mil equals 2 dots.
For 300 dpi printers, 3.3 mil equals 1 dot.
For all printers, default for Label Stock mode is 0.

Note: *To advance the label out to the tear bar in label stock mode, set n to the Continuous Stock mode value.*

If you enter a value for *n*, it applies to both Continuous mode and Label Stock mode, regardless of the mode in which you enter the value.

If you do not specify a value for *n*, the <SI>D command returns the printer to the default. This command is ineffective in self-strip applications.

Error Code, Request

Purpose

Solicits error codes from the printer.

Supported Printers

All

Syntax

<BEL>

Note: *The printer sends back the most recent error code as an ASCII number. The error code represents a command syntax error or a printer RAM usage error.*

If no errors have occurred since the printer was turned on, the printer sends a zero. It also resets the error code to 00.

Execute Shell Commands

Purpose

Enables you to use shell commands to retrieve and run system applications and utilities.

Supported Printers

All

Syntax

<ESC>.x,<*sexp*>

where:

<*sexp*> is the shell command to execute.

Note: *If you have a PM43, PM43c, or PM23c printer, you can use shell commands to configure the printer using Touchless configuration. For more information, see the [PM43, PM43c, and PM23c Mid-Range Printer User Manual](#).*

Exit and Close IPL

Purpose

Exits and closes the IPL application.

Supported Printers

All

Syntax

QUITIPL

Factory Defaults, Reset

Purpose

Sets the printer configuration to the factory defaults. When you exit Test and Service mode after sending this command, the printer performs a warm boot (it resets).

Supported Printers

All

Syntax

D

Example

<STX><ESC>T;D;R;<ETX>

Field, Select

Purpose

Selects a data field for entering or working with data.

Supported Printers

All

Syntax

<ESC>F*n* or <ESC>F"*name*"

where *n* is the number of the field.

Range: 0 to 199

Default: 0

Note: *The parameter for this command can either be the field number or the field name, but not both. If neither is present, the printer defaults to 0.*

If you use the field number, the printer enters all following data into field *n*. If you use the field *name*, the printer enters all following data into all fields with the specified name in the current format or page. You must bracket the field *name* with quotation marks ("r").

The printer generates an [error code (38)](#) if you enter an invalid field number.

Example

This example illustrates employing the Field, Select command to enter data into a field identified by a number:

```
<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E1;F1;<ETX>
<STX>H0;o450,50;c0;f3;h3;w2;b10;d0,35<ETX>
<STX>H1;o300,50;c0;h2;w2;f3<ETX>
<STX>B2;o250,50;c0,3;f3;h200;w2;i1;<ETX>
<STX>R<ETX>
<STX><ESC>E1<CAN><ETX>
<STX><ESC>F0<DEL>Example printing by field number<ETX>
<STX><ESC>F1<DEL>This is a test<ETX>
<STX><ESC>F2<DEL>Test<ETX>
<STX><US>1<ETX>
<STX><RS>1<ETX>
<STX><ETB><ETX>
```

Example

This example illustrates employing the Field, Select command to enter data into a field identified by a name:

<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E1;F1;<ETX>
<STX>H0,Example;o450,50;c0;f3;h3;w2;b10;d0,35<ETX>
<STX>H1,Text;o300,50;c0;h2;w2;f3<ETX>
<STX>B2,Barcode;o250,50;c0,3;f3;h200;w2;i1;<ETX>
<STX>R<ETX>
<STX><ESC>E1<CAN><ETX>
<STX><ESC>F"Example"<DEL>Example printing by field name<ETX>
<STX><ESC>F"Text"<DEL>This is a test<ETX>
<STX><ESC>F"Barcode"<DEL>Test<ETX>
<STX><US>1<ETX>
<STX><RS>1<ETX>
<STX><ETB><ETX>

Field Decrement, Set

Purpose

Sets the field decrement value for the selected field.

Supported Printers

All

Syntax

<ESC>D*n*

Parameters

n

Field decrement value.

Range: 0 to 9999

Default: 1

Note: *In the section of data separated by <FS> or <GS>, the printer decrements the values in data entry fields by n after it prints each batch.*

The printer generates an <u>error code (22)</u> if the decrement value is out of range.

First Data Entry Field, Select

Purpose

Sets the field pointer to the lowest numbered data entry field that can accept Print mode data.

Supported Printers

All

Syntax

<ACK>

Note: *This command ensures that data prints in the field with the lowest number if you do not want to specify a data field by its field number.*

Font, Transmit

Purpose

Uploads a font from the printer in the form of commands and data the printer receives to create the font.

Supported Printers

All

Syntax

<ESC>v*n*

The font information is returned in this format:

[*IDnumber*][*Legacy Name*][*Current Font*]

where:

IDnumber	is the font number.
Legacy Name	is the legacy name of the font.
Current Font	is the current resident font aliased to the legacy font.

Parameters

n

ID number of the font to be uploaded:

n	Font Name
0	7 x 9 Standard (86XX font)
1	7 x 11 OCR (86XX font)
2	10 x 14 Standard (86XX font)
3 – 6	User-defined fonts
7	5 x 7 Standard (86XX font)
8 – 19	User-defined fonts
20	8 point monospace
21	12 point monospace
22	20 point monospace

n	Font Name
23	OCR A
24	OCR B size 2
25	Swiss Mono 721 standard outline font
26	Swiss Mono 721 bold outline font
28	Dutch Roman 801 proportional outline font
30	6 point monospace bold
31	8 point monospace bold
32	10 point monospace standard
33	10 point monospace bold
34	12 point monospace bold
35	16 point monospace standard
36	16 point monospace bold
37	20 point monospace bold
38	24 point monospace standard
39	24 point monospace bold
40	30 point monospace bold
41	36 point monospace bold
50	Kanji outline font
51	Kanji monospace outline font
52	Katakana 12 x 16 bitmap
53	Katakana 16 x 24 bitmap
54	Katakana 24 x 36 bitmap
55	Kanji 16 x 16 bitmap
56	Kanji 24 x 24 bitmap
57	Kanji
58	Korean
59	Traditional Chinese
60	Simplified Chinese
61	Swiss 721
62	Swiss 721 bold

n	Font Name
63	Swiss 721 bold condensed
64	Prestige bold
65	Zurich extra condensed
66	Dutch 801 bold
67	Century Schoolbook
68	Futura light
69	Letter Gothic
70	DingDings

Range: 0 to 28, 30 to 41, 50 to 60 (downloadable Asian fonts), and 61 to 70

Note: *You can set n to a number from 0 to 70, depending on the fonts your printer supports. See Font Type, Select for values for n.*

If you send <ESC>v to the printer without specifying a value for the n parameter, the printer uploads the entire user-defined fonts directory.

Always transmit fonts in the current mode.

The printer generates an error code (27) if you enter an invalid number.

Form Feed

Purpose

Feeds a label out to the next print point.

Supported Printers

All

Syntax

<FF>

Note: *If you use self-strip, the printer feeds out one blank label to the strip pin, skipping an entire label.*

If you use batch operation with die-cut label stock, the label moves to the tear bar.

If you use continuous label stock, the label stock moves the same amount as the end-of-print skip distance.

Format, Transmit

Purpose

Uploads a format from the printer in the form of commands and data the printer uses to create the format.

Supported Printers

All

Syntax

<ESC>x*n*

Parameters

n

ID number of the format to be uploaded.

Range: 0 to 99

Note: *Information returned for a specified format is similar to this example:*

<ESC>x1
<STX>H0;o50,20;f0;c25;h20;w20;d0,130<ETX>
<STX>H1;o50,120;f0;c25;h20;w20;d0,130<ETX>
<STX>B2;o50,253;c0,0;h100;w2;i1;d0,100<ETX>

If you send <ESC>x to the printer without specifying a value for *n*, the printer uploads the entire format directory. The directory appears in this format:

[*IDnumber*][*name*][*type*][*storagesize*]

where:

IDnumber	is the format number specified by *n* in the command that created the format.
name	is the optional format name that may have been specified by *name* in the command that created the format.
type	is 0 for formats.
storagesize	is the number of bytes needed to store the format.

If formats are stored without an IDnumber, a list of all stored formats appears:

FORMAT1.FMT
FORMAT3.FMT

FORMAT4.FMT
FORMAT5.FMT

The printer generates an [error code (25)](#) if you enter an invalid number.

Formats, Print

Purpose

Prints all stored formats.

Supported Printers

All

Syntax

f

Hidden SSID, Set

Purpose

Determines if the radio is allowed to look for SSIDs that have been hidden to prevent unauthorized devices from connecting to the network.

Supported Printers

All

Syntax

<SI>ws,HIDDEN SSID,*n*

Parameters

n

Value: ENABLE or DISABLE

Hidden SSID, Transmit

Purpose

Transmits the hidden SSIDs.

Supported Printers

All

Syntax

<SI>wt,HIDDEN SSID

Ignore a List of Configuration Commands, Enable or Disable

Purpose

Determines if a set list of configuration commands is ignored. All <SI> shift commands can be ignored.

When this command is enabled, these configuration commands are ignored by default:

Syntax	Command
<SI>c	Cutter, Enable or Disable
<SI>D	End-of-Print Skip Distance, Set
<SI>d	Dark Adjust, Set
<SI>F	Top of Form, Set
<SI>f	Label Rest Point, Adjust
<SI>g	Media Sensitivity, Select
<SI>L	Maximum Label Length, Set
<SI>R	Label Retract, Enable or Disable
<SI>r	Label Retract Distance, Set
<SI>t	Self-Strip, Enable or Disable
<SI>W	Label Width, Set
<SI>X	Label Origin, X-Y Adjust

Supported Printers

All

Syntax

<SI>xc[,*m*]

Parameters

m

Enables or disables ignoring a list of configuration commands:

m	Description
0	Disables commands ignore (default)
1	Enables commands ignore

Note: *The file format is one command per line.*

If you change this parameter, you need to restart the printer for changes to take effect.

You can also enable or disable this command in the /home/user/config/ipl/IP.CFG file by modifying the CommandsIgnore setting:

- CommandsIgnore>0 (disable)
- CommandsIgnore>1 (enable)

Note: *You need to reboot the printer for the changes to take effect.*

IPL Command Reference

Increment and Decrement, Disable

Purpose

Resets any increment or decrement flags for the current field.

Supported Printers

All

Syntax

<ESC>N

Inner Authentication, Set

Purpose

Sets the inner authentication method to use when the EAP type if EAP-FAST, PEAP, or TTLS.

This command is only used when [ASSOCIATION](#) is set to TTLS, EAP-FAST, or PEAP. Selecting another EAP type disables this command but does not erase the settings.

Supported Printers

All

Syntax

<SI>ws,INNER AUTHENTICATION,*n*

Parameters

n

Values for *n* are:

- PAP (TTLS, only)
- MSCHAPv2 (default)
- EAP/MSCHAPv2
- EAP/MD5
- EAP/GTC
- EAP/TLS

Note: *PEAP and EAP-FAST also use EAP in the tunnel, so MSCHAPv2 and EAP/MSCHAPv2 are equivalent settings for PEAP.*

TTLS can use other authentication protocols directly, so you need to specify whether you are using EAP or running the protocol directly in the tunnel.

Inner Authentication, Transmit

Purpose

Transmits the inner authentication type.

This command is only used when [ASSOCIATION](#) is set to TTLS, EAP-FAST, or PEAP. Selecting another EAP type disables this command but does not erase the settings.

Supported Printers

All

Syntax

<SI>wt,INNER AUTHENTICATION

Yields one of these inner authentication values:

- PAP (TTLS, only)
- MSCHAPv2 (default)
- EAP/MSCHAPv2
- EAP/MD5
- EAP/GTC
- EAP/TLS

Note: *PEAP and EAP-FAST also use EAP in the tunnel, so MSCHAPv2 and EAP/MSCHAPv2 are equivalent settings for PEAP.*

Label and Gap Length, Transmit

Purpose

Transmits the label and gap length as measured by the number of 5 mil increments.

Supported Printers

All

Syntax

<ESC>L

Note: *Label length refers to the length of the label currently being processed. If the label is longer than the distance between the label sensor and the printhead, the printer transmits the length of the previous label.*

If you select continuous stock, the printer transmits the length defined by Maximum Label Length, Set.

For a 400 dpi printer, 5 mil equals 2 dots.

For a 300 dpi printer, 5 mil equals 1.5 dots.

For a 200 dpi printer, 5 mil equals 1 dot.

Label Origin, X-Y Adjust

Purpose

This command specifies where the x- and y-positions of the origin should be placed on the label.

Supported Printers

All

Syntax

<SI>X[*m1*][,*m2*]

Parameters

m1

Distance (in dots) to move the x-origin.

Range: -30 (closest to the leading edge) to 30

Default: 0

m2

Distance (in dots) to move the y-origin.

Range: -30 (closest to the middle of the label) to 30

Default: 0

Note: *IPL uses the system configuration for this setting. If you configured this setting with the command, verify that the value is accurate.*

Use this command to adjust the imaged position of the label on the media. This has the same effect as the "Form Adj Dots X" and "Form Adj Dots Y" parameters in Setup Mode.

If you use the Top of Form, Set command, the value for *m1* is added to that distance.

If you use the Label Width, Set command, the value for *m2* is added to that distance.

See Also:

Label Rest Point, Adjust

Label Retract Distance, Set

Top of Form, Set

Label Rest Point, Adjust

Purpose

Adjusts the point at which labels stop for removal. Use this command for self–strip and cutter applications.

Supported Printers

All

Syntax

<SI>f*n*

Parameters

n

Label stop point.

Range: –30 (farthest back) to +30 (farthest forward) in 5 mil increments

Default: 0

For a 400 dpi printhead, 5 mil equals 2 dots.
For a 300 dpi printhead, 5 mil equals 1.5 dots.
For a 200 dpi printhead, 5 mil equals 1 dot.

Note: *IPL uses the system configuration for this setting. If you configured this setting with the command, verify that the value is accurate.*

See Also:

Label Origin X–Y, Adjust

Label Retract Distance, Set

Top of Form, Set

Label Retract, Enable or Disable

Purpose

Turns the label retract option on or off.

Supported Printers

All

Syntax

<SI>R*n*

Parameters

n

Sets the label retract option:

n	Option
0	Disables label retract
1	Enables label retract (default)

Note: *If you select die-cut label stock, the printer determines the retract distance automatically.*

If you select continuous label stock, the printer uses the retract distance set by the Label Retract Distance, Set command.

See Also:

Label Stock Type, Select

Label Retract Distance, Set

Purpose

Sets the label retract distance.

Supported Printers

All

Syntax

<SI>r*n*

Parameters

n

Label retract distance in 5 mil increments.

Range: 0 to 399

Default: 0

For a 400 dpi printhead, 5 mil equals 2 dots.
For a 300 dpi printhead, 5 mil equals 1.5 dots.
For a 200 dpi printhead, 5 mil equals 1 dot.

Note: *IPL uses the system configuration for this setting. If you configured this setting with the command, verify that the value is accurate.*

This command works with continuous label stock only. The label retracts to this distance at the start of a print.

See Also:

[Label Origin X-Y, Adjust](#)

[Label Rest Point, Adjust](#)

[Top of Form, Set](#)

Label Stock Type, Select

Purpose

Selects the type of label stock.

Supported Printers

All

Syntax

<SI>T*n*

Parameters

n

Specifies the type of stock:

n	Type of Stock
0	Continuous label stock (no breaks between labels)
1	Label stock with gaps between labels
2	Label stock with marks between labels (on back of label stock)

Note: *To enable this command, reset the printer or turn the power off and on again after issuing the command.*

Label Width, Set

Purpose

Sets the label width in dot increments. For all supported printers, this command is effective upon execution.

Supported Printers

All

Syntax

<SI>W*n*

Parameters

n

Label width in dot increments. This value must be within the minimum and maximum number of dots for your printer. Calculations for all printers use a 5 mil dot.

Range: 50 to 896

Default: 840

Maximum Label Length, Set

Purpose

Defines the maximum label length.

Supported Printers

All

Syntax

<SI>L*n*

Parameters

n

Maximum label length in 5 mil increments.

Range: 100 to 4800

Default: 1200

For a 400 dpi printhead, 5 mil equals 2 dots.
For a 300 dpi printhead, 5 mil equals 1.5 dots.
For a 200 dpi printhead, 5 mil equals 1 dot.

Media Fault Recovery Mode, Set

Purpose

Sets the media fault recovery mode.

Supported Printers

All

Syntax

<SI>e*n*

Parameters

n

Sets media fault recovery mode:

n	Mode
0	Reprint interrupted label (default)
1	Do not reprint interrupted label

Media Sensitivity, Select

Purpose

Selects the media sensitivity of the printer.

Supported Printers

All

Syntax

<SI>g*n*[,*m*]

Parameters

n

Sets the media type:

n	Media Type
0	Direct thermal media (default)
1	Thermal transfer media

m

Sets the darkness or media sensitivity value. The default is 180 for direct thermal and 563 for thermal transfer media.

Note: *For help setting m, see your printer user manual.*

Memory Usage, Transmit

Purpose

Returns the amount of total storage memory available for formats, fonts, and user–defined characters.

Supported Printers

All

Syntax

<ESC>m*n*

Values for *n* can be:

0	Transmits the amounts of total flash memory and free flash memory. This value is the default. 0, NUL, other characters follow parameter 0 transmit.
1	Transmits the amount of SRAM, total RAM, and total flash memory. +,-,1 to 9 follow parameter 1 transmit.

Note: *Flash memory/home partition is available to users for storage of fonts, formats, pages, UDC and UDF files. The printer uploads the amount of Flash /home memory storage available for user resources.*

Network Key, Set

Purpose

Determines which of the four keys the printer uses to transmit data. You can select Network Key 1, Network Key 2, Network Key 3, or Network Key 4. You use the Network Key Index, Set command to select which key to use to transmit. By default, WEP is disabled, and no keys are configured.

Network keys are entered either in a hexadecimal format. A string starting with "0x" (a zero followed by a lowercase x) where WEP 64 is followed 10 hexadecimal characters and WEP 128 is followed by 26 hexadecimal characters.

You can change Network keys on the printer's home page.

Supported Printers

All

Syntax

<SI>ws,NETWORK KEY 1,*n*

<SI>ws,NETWORK KEY 2,*n*

<SI>ws,NETWORK KEY 3,*n*

<SI>ws,NETWORK KEY 4,*n*

Parameters

n

Values for *n* depend on whether you are setting WEP 64 or WEP 128:

WEP Protocol	Bits	Alphanumeric Characters
WEP 64	40	5
WEP 128	104	13

Network Key, Transmit

Purpose

Transmits the Network key value.

Supported Printers

All

Syntax

<SI>wt,NETWORK KEY 1

<SI>wt,NETWORK KEY 2

<SI>wt,NETWORK KEY 3

<SI>wt,NETWORK KEY 4

If the Network key is not configured, this command yields an empty string.

If the Network key is configured, this command yields "****" (four asterisk symbols).

Note: *To see which Network key is selected, use the* *Network Key Index, Transmit* *command.*

Network Key Index, Set

Purpose

Sets the WEP (Wired Equivalent Privacy) key used to encrypt the data sent over radio. The printer can have up to four WEP 64 or WEP 128 keys. You use the Network Key, Set command to set WEP values for each key. By default, WEP is disabled, and no keys are configured.

Supported Printers

All

Syntax

<SI>ws,NETWORK KEY INDEX,*n*

Parameters

n

Values for *n* are:

n	Description
0	Disables Network security. (default)
1	Selects NETWORK KEY 1 for security. A Network Key, Set value must be set for NETWORK KEY 1.
2	Selects NETWORK KEY 2 for security. A Network Key, Set value must be set for NETWORK KEY 2.
3	Selects NETWORK KEY 3 for security. A Network Key, Set value must be set for NETWORK KEY 3.
4	Selects NETWORK KEY 4 for security. A Network Key, Set value must be set for NETWORK KEY 4.

Note: *You can change the Network keys on the printer home page.*

Only allowed users can set this command.

Network Key Index, Transmit

Purpose

Transmits the WEP (Wired Equivalent Privacy) key used to encrypt the data sent over radio.

Supported Printers

All

Syntax

<SI>wt,NETWORK KEY INDEX

Yields a Network key value:

Value	Description
0	Network security is disabled. (default)
1	Network Key 1 is selected for security. A Network Key, Set value should be set for Network Key 1.
2	Network Key 2 is selected for security. A Network Key, Set value should be set for Network Key 2.
3	Network Key 3 is selected for security. A Network Key, Set value should be set for Network Key 3.
4	Network Key 4 is selected for security. A Network Key, Set value should be set for Network Key 4.

Note: *WEP Enabled/Disabled is displayed on the network test label.*

The printer web page shows the keys used and Network key set.

Only allowed users can view the Network key.

Network Name (SSID), Set

Purpose

Sets the Network Name, also known as the SSID (Service Set Identifier) .

Supported Printers

All

Syntax

<SI>ws,NETWORK NAME (SSID),*n*

Parameters

n

Values for *n* are from 0 to 32 octets.

Default: Honeywell

Network Name (SSID), Transmit

Purpose

Transmits the Network Name, also known as the SSID (Service Set Identifier) .

Supported Printers

All

Syntax

<SI>wt,NETWORK NAME (SSID)

Yields an SSID.

Default: Honeywell

Network Type, Set

Purpose

Sets the current wireless setting behavior of the printers. Ad Hoc mode allows the printer to communicate directly with another printer. Infrastructure mode allows the printer to communicate through an access point.

Supported Printers

All

Syntax

<SI>ws,NETWORK TYPE,*n*

Parameters

n

Sets the wireless behavior.

Value: Ad Hoc, Infrastructure

Default: Infrastructure

Network Type, Transmit

Purpose

Transmits the current wireless setting behavior of the printers (Ad Hoc or Infrastructure).

Supported Printers

All

Syntax

<SI>wt,NETWORK TYPE

Options Selected, Transmit

Purpose

Uploads the list of selected options.

Supported Printers

All

Syntax

<ESC>O

Return Values

These values are returned by the printer:

Value	Description
0	No options selected
1	Cutter
4	Self–strip
6	RFID

Page, Select

Purpose

Selects a page for data entry or printing.

Supported Printers

All

Syntax

<ESC>G*n*

Parameters

n

Page ID number.

Range: 0 to 9

Default: 0

Note: *After you select the page, the field pointer points to the lowest numbered data entry field of the lowest position format.*

The printer clears all host-entered data from this page.

The printer generates an error code (36) if you enter an invalid page number.

Page, Transmit

Purpose

Uploads a page from the printer in the form of commands used to create a format. It also uploads all formats in a page.

Supported Printers

All

Syntax

<ESC>y*n*

Parameters

n

Page ID number.
Range: 1 to 9

Note: *If you send <ESC>y to the printer without specifying a value for n, the printer uploads the entire page directory in this format:*

[*IDnumber*][*name*][*type*][*storagesize*]

where:

IDnumber	is the page number that was specified by *n* in the command that cre‐ated the page.
name	is the optional page name that may have been specified by *name* in the command that created the page.
type	is 1 for pages.
storagesize	is always 0 for a page.

The printer generates an error code (26) if you enter an invalid number.

Pages, Print

Purpose

Prints the pages stored on the printer.

Supported Printers

All

Syntax

p

Passkey, Set

Purpose

Sets the Bluetooth passkey of the printer. The Bluetooth passkey is case-sensitive and can be up to 16 printable characters in length. If you enter more than 16 characters, the input is truncated to the first 16 characters.

Changing the passkey clears the list of paired devices.

Supported Printers

All

Syntax

<SI>Bs,.PASS KEY,*s..s*

Parameters

s..s

where *s..s* = 16 printable characters

Default: 1234

Note: *If the printer is paired with another Bluetooth device and the printer is rebooted, the paired connection between the Bluetooth device and the printer is automatically restored, without having to send the passkey.*

You need administrator rights to use this command.

Passkey, Transmit

Purpose

Transmits the Bluetooth passkey of the printer to the host device. The Bluetooth passkey is case-sensitive and can be up to 16 printable characters in length. You need administrator rights to use this command.

Supported Printers

All

Syntax

<SI>Bt,.PASS KEY

Yields four asterisks (****), regardless of the length of the passkey.

Default is 1234.

Note: *Only allowed users can view the Bluetooth passkey information.*

Postamble, Set

Purpose

Sets the postamble character.

Supported Printers

All

Syntax

<EOT>n

Parameters

n

Specifies the postamble character.

n can be any ASCII character.

Default: <NUL>

Note: *When n = <NUL>, the printer does not send a postamble character.*

Power Management Mode, Set

Purpose

Sets the driver power management mode.

Supported Printers

All

Syntax

<SI>ws,POWER MODE,*n*

Parameters

n

Sets the driver power management mode:

n	Description
0	CAM (Constant Awake Mode) (default)
1	PS (Power Saving)
2	FAST PS (Fast Power Saving)

Button	Description
	From the Ready screen, press to toggle between the Ready screen and the printer main menu. Password 1138 enters the DSim setup. Password 8311 enters Honeywell setup. You can use the **Back** button to exit the password screen.
	Moves the cursor between options.
	Accepts input, selects the item in the menu, or moves to the next level in the menu.
	Moves to the previous level in the menu.

Button	Description
	When the printer is starting, press and hold to enter calibration or recovery mode. When the printer is printing, press to pause. When the printer is paused, press to continue printing. When the printer is idle, press to feed the media. Press and hold for two seconds to perform a testfeed. When there is an error, press to advance the media.

Note: *Setting Power Management Mode to Power Saving or Fast Power Saving conserves battery life, but it may also affect the reliability of the network connection.*

Power Management Mode, Transmit

Purpose

Transmits the driver power management mode.

Supported Printers

All

Syntax

<SI>wt,POWER MODE

Yields one of these values:

Value	Description
0	CAM (Constant Awake Mode) (default)
1	PS (Power Saving)
2	FAST PS (Fast Power Saving)

Power Saving Mode, Set

Purpose

Enables or disables the Bluetooth power saving mode on the printer.

Supported Printers

All

Syntax

<SI>Bs,POWER SAVING MODE,*n*

Parameters

n

Enables or disables power saving mode:

n	Description
0	Enables the power saving mode
1	Disables the power saving mode

Print Quality Label, Print

Purpose

Prints the print quality program and model number label.

Supported Printers

All

Syntax

Q

Print Speed, Set

Purpose

Sets the print speed.

Supported Printers

All

Syntax

<SI>S*n*

Parameters

n

Print speed.

Range: dependent on the printer platform

Default: determined by the printer

Printhead Loading Mode, Select

Purpose

Selects the printhead loading mode that affects how the whole image prints on the label. Mirror Printing mode reverses the order in which data loads into the printhead. Inverse Printing mode causes all pixels that are white to invert to black and vice versa.

Supported Printers

All

Syntax

<SI>h*n*[,*m*]

Parameters

n

Selects the print mode:

n	Mode
0	Normal printing (default)
1	Mirror printing

m

Selects the print mode:

m	Mode
0	Normal printing (default)
1	Inverse printing mode

Note: *The printhead is not under warranty if you use Inverse Printing mode for batch printing. Honeywell does not recommend using Inverse Printing mode for batch printing. For best results with Inverse Printing mode, use a maximum print density of 35 percent.*

Printhead Parameters, Transmit

Purpose

Transmits the number and size of dots in the printhead back to the host. For example: 896,5.0.

Supported Printers

All

Syntax

<ESC>H

Program Mode, Exit

Purpose

Instructs the printer to exit Program mode and enter Print mode. It saves any format or page currently being edited.

Supported Printers

All

Syntax

R

Protected Access Credential, Set

Purpose

Specifies the PAC (Protected Access Credential) file used by EAP–FAST authentication.

Supported Printers

All

Syntax

<SI>ws,PAC,<*sexp*>

Parameters

<*sexp*>

Is a valid PAC path value. Default: No PAC file installed.

Note: *Setting is automatically assigned by the printer if ACQUIRE PAC is enabled and the installed PAC file fails authenticating the printer to the network.*

Setting is only used when ASSOCIATION is set to EAP–FAST.

To manually import a PAC file using a pass phrase, the pass phrase should be given after the path of the PAC file.

Pass phrase used to decrypt the PAC file should not be stored in the printer and will be used only during the PAC file installation.

The PAC shown would be the A-ID (Authority Identity) of the last PAC successfully installed and not the path of the file.

Only one PAC file can be installed at a time on the printer.

The installed PAC file value is shown on the network test label only if the printer is using 802.1x security.

Protected Access Credential, Transmit

Purpose

Prints the current PAC A-ID (Authority-Identity).

Supported Printers

All

Syntax

<SI>wt,PAC

Note: *The PAC that appears is the A-ID (Authority Identity) of the last PAC successfully installed and not the path of the file.*

Region, Transmit

Purpose

Some countries and regulatory authorities only allow the use of a subset of the 14 channels specified in the 802.11 b/g standard. The Region, or Regulatory Domain, command is used to transmit the subset of channels that the printer can use.

The Region can only be set by Honeywell-authorized personnel. If the wrong region is set, please contact your Honeywell representative immediately. Using the Wireless LAN network with an incorrect Region setting may violate applicable laws.

The Region setting is not affected by setting the printer to its factory default settings.

Supported Printers

All

Syntax

<SI>wt,.REGION

Yields one of these values:

Value	Country	Allowed Channels
FCC (or USA)	U.S.A.	1 to 11 (default)
IC (or Canada)	Canada	1 to 11
ETSI (or EU)	EU countries*, Iceland, Liechtenstein, Norway, and Switzerland	1 to 13
MKK (or Japan)	Japan	1 to 14

Note: *Certain restrictions apply to outdoor use in France.*

Only allowed users can view the Region.

Remaining Quantity and Batch Count, Transmit

Purpose

Uploads the remaining quantity and batch counts for the current print job.

Supported Printers

All

Syntax

<ESC>Q

Reserve Printer, Set

Purpose

Enables the printer to be reserved exclusively for another Bluetooth device. The first Bluetooth device that successfully establishes a connection with your printer locks out connection attempts from other Bluetooth devices.

Supported Printers

All

Syntax

<SI>Bs,RESERVE,*n*

Parameters

n

Enables or disables printer reserve:

n	Description
0	Disables reserving (default)
1	Enables reserving

Reserve Printer, Transmit

Purpose

Transmits whether the [Reserve Printer, Set](#) command has been activated.

Supported Printers

All

Syntax

<SI>Bt,RESERVE

Reset

Purpose

Executes a printer power-up reset immediately.

Supported Printers

All

Syntax

<DLE>

Note: *The printer erases all data and commands in the input buffer upon reset.*

Example

The first DLE is a transparency character and instructs the printer to use the <DLE> as a reset command:

<STX><DLE><DLE><ETX>

RFID Parameters, Set

Purpose

Sets the RFID mode (on or off) and sets the TAGADJUST value and number of label retries.

Supported Printers

All

Syntax

\<SI>J*n*[,*m*][,*p*]

Parameters

n

Enables or disables RFID mode:

n	Description
0	Disables RFID mode. RFID commands are ignored.
1	Enables RFID mode (default).

m

Specifies the distance (in dots) a label must be moved from the default start of print point to align the RFID tag over the antenna and enable successful read and write operations to the tag's memory.

Range: negative distance (in dots) from the thermal printhead to the tear-off bar, or positive distance up to the maximum label length. This distance is known as the TAGADJUST value.

A negative *m* value means the tag is originally positioned in front of the antenna and a positive *m* value means the label is originally positioned behind the antenna.

If you change the start of print point, you may also need to change *m*. The move distance = TAGADJUST - STOPADJUST. STOPADJUST is any adjustment, such as end-of-print skip distance that is done at the end of a label.

Example

- If TAGADJUST = 0 and End of Print (EOP) skip = 100, the label retracts 100 to access the tag.
- If TAGADJUST = 100 and the EOP skip = 100, the label does not move.

When using thermal transfer media, *m* should not be greater than the maximum rewind spring allowance, because it affects the print quality of the label.

p

Specifies the number of labels to retry if accessing a tag fails.

If *p* = 0, the printer does not print any "VOID" labels and the labels do not advance.

If *p* = 1, a maximum of 1 "VOID" label prints and so on.

Range: 0 to 10

Default: 1

Note: *If a read or write operation to the tag's memory fails, "VOID" or some other text is printed on the label and the next label is tried. This procedure is repeated until the read or write operation succeeds or until the specified number of labels to retry is reached.*

When using a cutter, the retract distance cannot be greater than the distance from the cutter to the thermal printhead.

See Also:

[RFID Tag Void Text, Set](#)

Roaming Bias, Set

Purpose

Controls the roaming inclination of the printer. The higher the level, the less inclined the printer is to switch access points. Based on the printer RSSI (received signal strength).

Supported Printers

All

Syntax

<SI>ws,ROAMING,*n*

Parameters

n

Sets the roaming behavior:

- 0 (default)
- Level 1
- Level 2
- Level 3

Roaming Bias, Transmit

Purpose

Transmits the current roaming behavior of the printer. A higher Roaming Bias value makes the network adapter less inclined to roam.

Supported Printers

All

Syntax

<SI>wt,ROAMING

Yields one of these values:

- 0 (default)
- Level 1
- Level 2
- Level 3

Security, Set

Purpose

Enables or disables Bluetooth authentication on the printer. Pairing of up to 8 devices is automatically enabled when you enable authentication. The pairing list is cleared by changing the passkey.

Supported Printers

All

Syntax

<SI>Bs,SECURITY,*n*

Parameters

n

Enables or disables Bluetooth authentication:

n	Description
Disable	Disables authentication
Authentication	Enables authentication
Auth+Encrypt	Enables authentication+encryption

Security, Transmit

Purpose

Transmits the Bluetooth authentication status of the printer to the host device.

Supported Printers

All

Syntax

<SI>Bt,SECURITY

Yields one of these values:

Value	Description
0	Authentication disabled
1	Authentication enabled

Self-Strip, Enable or Disable

Purpose

Turns the label taken sensor on or off, which enables or disables the label dispenser (self–strip) option.

Supported Printers

All

Syntax

<SI>t*n*, *m*, *o*

Parameters

n

Enables or disables self–strip:

n	Description
0	Disables self–strip (default)
1	Enables self-strip
2	Enable self–strip, void labels rewind with liner, also need to set *m* and *o*
3	Enables self–strip, starts the internal rewind stepper motor, also need to set *m*

m

If *n*=2, enables or disables rewinding:

m	Description
0	Disables rewinding (default)
1	Enables rewinding

If *n*=3, *m* is the number of dots the rewind motor starts before or after the media starts feeding.

Range = –ve max label length to +ve max label length

Default: 100

Set *m* to –1 to turn off the motor.

o

The number of dots the rewind stepper motor starts after the media starts feeding.

Range = –ve max label length to +ve max label length

Default: 100

Server Common Name 1, Set

Purpose

Sets the server common name used for Server Certificate Validation.

This command is only used when [ASSOCIATION](#) is set to either TTLS or PEAP. Selecting another EAP type disables this command but does not erase the settings.

Supported Printers

All

Syntax

<SI>ws,.SERVER COMMON NAME 1,*n*

Parameters

n

A server common name.

Value: Up to 96 characters. Honeywell recommends setting a server common name that is longer than 8 characters.

Default: None

Note: *If Server Common Name 1 is not set, [Server Common Name 2](#) is used. If Server Common Name 2 is also not set, any common name is accepted.*

Only allowed users can modify this command.

Server Common Name 1, Transmit

Purpose

Transmits the server common name used for Server Certificate Validation.

This command is only used when [ASSOCIATION](#) is set to either TTLS or PEAP. Selecting another EAP type disables this command but does not erase the settings.

Supported Printers

All

Syntax

<SI>wt,.SERVER COMMON NAME 1

Yields the Server Common Name 1.

Note: *Only allowed users can view the server common name.*

Server Common Name 2, Set

Purpose

Sets the server common name used for Server Certificate Validation.

This command is only used when ASSOCIATION is set to either TTLS or PEAP. Selecting another EAP type disables this command but does not erase the settings.

Supported Printers

All

Syntax

<SI>ws,.SERVER COMMON NAME 2,*n*

Parameters

n

A server common name.

Value: Up to 96 characters. Honeywell recommends setting a server common name that is longer than 8 characters.

Default: None

Note: *If Server Common Name 1 is not set, Server Common Name 2 is used. If Server Common Name 2 is also not set, any common name is accepted.*

Only allowed users can modify this command.

Server Common Name 2, Transmit

Purpose

Transmits the server common name used for Server Certificate Validation.

This command is only used when ASSOCIATION is set to either TTLS or PEAP. Selecting another EAP type disables this command but does not erase the settings.

Supported Printers

All

Syntax

<SI>wt,.SERVER COMMON NAME 2

Yields the Server Common Name 2.

Note: *Only allowed users can view the server common name.*

Setting Network Parameters in Manual Mode

Purpose

To assign network values manually, connect the printer to the serial port on the host PC, start a communications program (such as HyperTerminal), and send this command.

Supported Printers

All

Syntax

<SI>n[*i*[,*m1*,*m2*]]p

Parameters

i

The IP address, in the format *n.n.n.n*, where *n* is a number in the range 0-255.

m1

The subnet mask address written in the same format.

m2

The router address written in the same format.

p

The network interface type setting. Value 0 selects an Ethernet Interface, while value 1 selects a Wireless 802.11 Interface. You need to reboot the printer for this setting to take effect.

Note: *Sending this command automatically places the printer in MANUAL IP selection mode, if you specify at least the first two parameters (IP and subnet mask address).*

If you specify only one parameter, such as the IP address, you need to place the printer in MANUAL mode using the printer's keyboard before you send the command. Otherwise, the command has no effect.

You can confirm the IP address by sending the upload configuration parameters command.

Example

This example sets the IP selection to DHCP+BOOTP:

<STX><SI>n<ETX>

This example sets the IP address to 192.168.235.86 and the subnet mask to 255.255.255.0 with no specified router:

<STX><SI>n192.168.235.86,255.255.255.0<ETX>

Signal Strength, Transmit

Purpose

Transmits the signal strength.

Supported Printers

All

Syntax

<SI>wt,SIGNAL

Yields the signal strength from 0 (no signal) to 100 (maximum signal strength).

Slash Zero, Enable or Disable

Purpose

Determines if the regular zero is replaced with a slashed zero.

Supported Printers

All

Syntax

<SI>z*n*

Parameters

n

Enables or disables using a slashed zero character:

n	Description
0	Disables slashed zero
1	Enables slashed zero

Note: *This command only works if* Printer Language, Select *is set to 0 (U.S.A.).*

This command does not apply to OCR fonts 23 and 24.

Software Configuration Label, Print

Purpose

Prints a label providing software configuration information.

Supported Printers

All

Syntax

s

Speed, Transmit

Purpose

Transmits the current communication speed between the printer and access point. To improve overall performance, the printer's network card may select a communication speed that is lower than the maximum.

Supported Printers

All

Syntax

<SI>wt,SPEED

Yields the communication speed from 0 to 54 Mbps.

Start and Stop Codes (Code 39), Print

Purpose

Instructs the current Code 39 field to print only the start and stop characters.

Supported Printers

All

Syntax

<ESC><SP>

where <SP> is the space character.

Note: *The printer clears all previous data from the current field.*

Status Dump

Purpose

Causes the printer to upload all current printer status.

Supported Printers

All

Syntax

<VT>

Note: *The printer uploads the status in this order of priority for Honeywell Standard Protocol:*

Standard Text	Status
<GS>	Buffer already full
<SO>	Printhead test fail
<US>	Label path open
<US>	Ribbon fault
<EM>	No label stock
<DC3>	Buffer now full
<EOT>	RFID tag write error
<VT>	RFID Tag read error
<BS>	Takeup reel full
<SI>	Printhead hot
<FS>	Label at strip pin
<ACK>	RFID tag write okay
<DC1>	Skipping
<DC1>	Printing
<DC1>	Ready

These status messages are not uploaded to the PC23d, PC43d, or PC43t printer:

- <BS> Takeup reel full
- <SO> Printhead test fail

Status Enquiry

Purpose

Transmits the current printer status to the host.

Supported Printers

All

Syntax

<ENQ>

Note: *The printer uploads the status in this order of priority for Honeywell Standard Protocol:*

Standard Text	Status
<GS>	Buffer already full
<SO>	Printhead test fail
<US>	Label path open
<US>	Ribbon fault
<EM>	No label stock
<DC3>	Buffer now full
<DC3>	Offline
<EOT>	RFID tag write error
<VT>	RFID Tag read error
<SI>	Printhead hot
<FS>	Label at strip pin
<ACK>	RFID tag write okay
<DC3>	Pause mode
<DC1>	Skipping
<DC1>	Printing
<DC1>	Ready

These status messages are not uploaded to the PC23d, PC43d, or PC43t printer:

- <BS> Takeup reel full
- <SO> Printhead test fail

Test and Service Mode, Enter

Purpose

Enters Test and Service mode.

Supported Printers

All

Syntax

<ESC>T

Note: *The printer completes all print jobs before executing this command. When the printer enters Test and Service mode, it erases any host-entered data that was sent prior to the command.*

Test and Service Mode, Exit

Purpose

Causes the printer to exit Test and Service mode.

Supported Printers

All

Syntax

R

Top of Form, Set

Purpose

Sets the top of form (left margin or start print point).

Supported Printers

All

Syntax

<SI>F*n*

Parameters

n

Distance in 5 mil increments from the label origin to its leading edge.

Range: –10 to 4000 in 5 mil increments

Default: 20

For a 400 dpi printhead, 5 mil equals 2 dots.
For a 300 dpi printhead, 5 mil equals 1.5 dots.
For a 200 dpi printhead, 5 mil equals 1 dot.

Note: *Negative values for n let you decrease the margin and print closer to the edge of the label.*

IPL uses the system configuration for this setting. If you configured this setting with the command, verify that the value is accurate.

See Also:

[Label Origin X–Y, Adjust](#)

[Label Rest Point, Adjust](#)

[Label Retract Distance, Set](#)

User Name, Set

Purpose

Sets the EAP (Extensible Authentication Protocol) user name used to log on to the network.

Supported Printers

All

Syntax

<SI>ws,USER NAME,*n*

Parameters

n

An EAP user name.

Value: Up to 96 characters. Honeywell recommends setting a user name that is longer than 8 characters.

Default = anonymous

Note: *Only allowed users can modify this command.*

User Name, Transmit

Purpose

Transmits the EAP (Extensible Authentication Protocol) user name used to log on to the network.

Supported Printers

All

Syntax

<SI>wt,USER NAME

Note: *Only allowed users can view the EAP user name.*

User Password, Set

Purpose

Sets the EAP (Extensible Authentication Protocol) password used to log on to the network.

Supported Printers

All

Syntax

<SI>ws,USER PASSWORD,*n*

Parameters

n

An EAP password.

Value: Up to 96 characters. Honeywell recommends setting a password that is longer than 8 characters.

Default: anonymous

User Password, Transmit

Purpose

Transmits the EAP (Extensible Authentication Protocol) password used to log on to the network.

Supported Printers

All

Syntax

<SI>wt,USER PASSWORD

If the User Password is not configured, this command yields an empty string.

If the User Password is configured, this command yields "****" (four asterisk symbols).

User-Defined Characters (UDC) and Graphics, Print

Purpose

Prints the user-defined characters and graphics stored on the printer.

Supported Printers

All

Syntax

g

User-Defined Characters, Transmit

Purpose

Uploads a graphic (user-defined character) from the printer in the form of commands and data the printer receives to create the graphic.

Supported Printers

All

Syntax

<ESC>u*n*

Parameters

n

Graphic ID number.

Range: 0 to 99

Note: *This command only works for those user-defined characters that are sent to the printer in the form of IPL user-defined characters command format. IPL does not support graphics that are uploaded using the webpage or other method.*

If you directly edit the user-defined character graphic file, the transmit command will return the data that was used to create the original graphic.

If you send <ESC>u to the printer without specifying a value for n, the printer uploads the entire graphics directory. The directory appears in this format:

Image1
Image2
Image3

Note: *The printer generates an error code (28) if you enter an invalid number.*

User-Defined Fonts, Print

Purpose

Prints the user-defined fonts stored on the printer.

Supported Printers

All

Syntax

t

Validate, Set

Purpose

Certain protocols, such as EAP-TTLS, PEAP, and EAP-TLS, allow you to verify the identity of the authentication server as the server verifies your identity. This is called mutual authentication. Turn on Validate Certificate to verify the identity of the authentication server based on its certificate when authenticating with EAP-TTLS, PEAP, and EAP-TLS. Honeywell recommends that you enable Validate Certificate.

Supported Printers

All

Syntax

<SI>ws,VALIDATE CERTIFICATE,*n*

Parameters

n

Sets server certificate validation:

n	Description
ON	Turns on server certificate validation. (default)
OFF	Turns off server certificate validation.

Note: *If a real-time clock (RTC) is not installed, the current time cannot be reliably read and validation does not take into account the current date. Validation may still occur, but less reliably than with an RTC.*

Make sure that the Certificate Authority *setting contains a valid CA Certificate that can be used to validate the server certificate.*

Validate, Transmit

Purpose

Transmits the current validate value of the host device's server certificate.

This command is only used when ASSOCIATION is set to either TTLS or PEAP. Selecting another EAP type disables this command but does not erase the settings.

Supported Printers

All

Syntax

<SI>wt,VALIDATE CERTIFICATE

Yields one of these values:

Value	Description
ON	Server certificate validation is turned on. (default)
OFF	Server certificate validation is turned off.

Version Number, Transmit

Purpose

Transmits the program, version, and model numbers.

Supported Printers

All

Syntax

<ESC>M*n*

Parameters

n

Specifies which numbers to return:

n	Description
0	Returns program number and version number (default)
1	Returns program number, version number, and model number

Note: *This command uploads the program and software version number to the host in this format:*

Parameter	Response from Printer
<ESC>M0	IPL 1.01 Fingerprint P10.03.006446
<ESC>M1	IPL 1.01 Fingerprint P10.03.006446 PM43c

<ESC>M is interpreted the same as <ESC>M0.

Warm Boot

Purpose

Resets the printer with a warm boot.

Supported Printers

All

Syntax

<BS>

Note: *Unlike the <DLE> command, this command does not take effect immediately. The printer executes all previous commands before the warm boot takes effect.*

Any data that is sent after this command and before the printer finishes rebooting is lost. Use this command when configuration changes require a printer reset.

Printer Language, Select

Purpose

Selects the printer language.

Supported Printers

All

Syntax

<SI>l*n*

Parameters

n

Specifies the language.

Default: 0

Values for *n*:

n	Language
0	U.S.A.
1	United Kingdom
2	Germany
3	Denmark
4	France
5	Sweden
6	Italy
7	Spain
8	8-Bit ASCII
9	Switzerland
10	Code Page 850
11	Code Page 1250, Central Europe
12	Code Page 1251, Cyrillic, Russian
13	Code Page 1252, Latin 1, Western Europe
14	Code Page 1253, Greek

n	Language
15	Code Page 1254, Turkish
16	Code Page 1255, Hebrew
17	Code Page 1256, Arabic
18	Code Page 1257, Baltic Rim
19	Code Page 1258, Vietnamese
20	Code Page 874, Thai
30	Code Page 932, Shift JIS, Japanese
31	Code Page 936, GB 2312-80, Simplified Chinese
32	Code Page 949, KSC5601, Korean Hangeul
33	Code Page 950, Big 5, Traditional Chinese
40	UTF-8

Note: *You can only select one printer language per print job. Bitmap user-defined fonts (including bitmap TrueType) do not use code pages. If your label format requires several language fonts, you can:*

- *specify a different language for each human-readable or interpretive field.*

- *create bitmap version of the TrueType fonts.*

- *create your own bitmap fonts.*

Resident fonts (those that were installed at the factory) use languages 0 through 10. The default setting probably provides all the special characters you will need, but you may need to determine if one of the other installed languages is better for your application. Code pages 11 through 33 do not work with resident fonts.

If you are using a TrueType font (not bitmap), you must match the code page to your language needs. Do not use languages 0 through 10 with scalable TrueType fonts.

If you are using a downloaded outline (that is, not bitmap) Japanese, Chinese, or Korean TrueType font, you must first locate the correct code page and download it to your printer. (All others are already stored in your printer.) Select the corresponding code page using the Printer Language, Select command.

UTF-8 data is encoded using sequences of 1 to 4 bytes. This table summarizes the different byte sequences of UTF-8 data that is transformed to a character number. The UTF-8 byte sequence (x, y, and z bits) in this table represents a character number in the range of the left column.

Character Number Range	UTF-8 Byte Sequence
0000 to 007F, xxxxxxx	0xxxxxxx
0080 to 07FF, yyyyyxxxxxx	110yyyyy 10xxxxxx

Character Number Range	UTF–8 Byte Sequence
0800 to FFFF, zzzzyyyyyyxxxxxx	1110zzzz 10yyyyyy 10xxxxxx
10000 to 10FFFF, TBD	TBD

The character number is calculated by getting the lower-order bits from the last byte of the sequence and proceeding to the left until there are no x, y, and z bits left. For example, the UTF–8 byte sequence to print a Greek "e" is 0xCE 0xB5.

Font 61 has the most international characters of all of the resident fonts.

See Also:

[Download Fonts to the Printer](#)

[Font Type, Select](#)

[ASCII Tables and International Character Sets](#)

RFID Tag Formats: EPC-HEX64

Hex representation of the complete memory area on an 8 byte tag.

Hex String

0-9, a-f, A-F

RFID Tag Formats: EPC-HEX96

Hex representation of the complete memory area on a 12 byte tag.

Hex String

0-9, a-f, A-F

Example for Fixed Data Field

d3,0102030405060708090A0B0C

RFID Tag Formats: EPC-URN

A standardized format for writing data to a tag. URI forms are provided for pure identities, which contain just the EPC fields that serve to distinguish one object from another. These URIs take the form of Uniform Resource Names (URNs), with a different URN namespace allocated for each pure identity type.

URN String

For the EPCglobal tag formats, the pure identity URI representation is:

urn:epc:tag:epc-format:parameter 1.parameter 2.parameter 3

Example for Fixed Data Field

d3,urn:epc:tag:sscc-96:0.12345678.987654321

RFID Tag Formats: GIAI-64

Assigned to individual objects and thus requires no additional fields to serve as an EPC pure identity. Holds 8 bytes of data.

Filter Value

Numeric, 0–7

Company Prefix

Numeric, 0–16 383

Individual Asset Reference

Numeric, 0–549 755 813 887

Serial Number

Numeric, 0–524 287

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT>individual asset reference

RFID Tag Formats: GIAI-96

Assigned to individual objects and thus requires no additional fields to serve as an EPC pure identity. Holds 12 bytes of data.

Filter Value

Numeric, 0–7

Company Prefix

Numeric, 6–12 digits

Individual Asset Reference

Numeric, 18–12 digits

The total length of the company prefix + individual asset reference = 24 digits.

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT>individual asset reference

RFID Tag Formats: GID-96

12 byte general identifier that is independent of existing specifications or identity schemes.

General Manager Number

Numeric, 0–268 435 455

Object Class

Numeric, 0–16 777 215

Serial Number

Numeric, 0–68 719 476 735

Example for a Fixed Data Field

d3,general manager number<HT>object class<HT>serial number

RFID Tag Formats: GRAI-64

Assigned to individual objects and thus requires no additional fields to serve as an EPC pure identity. Holds 8 bytes of data.

Filter Value

Numeric, 0-7

Company Prefix

Numeric, 0-16 383

Asset Type

Numeric, 0-999 999

Serial Number

Numeric, 0-524 287

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT>asset type<HT>serial number

RFID Tag Formats: GRAI-96

Assigned to individual objects and thus requires no additional fields to serve as an EPC pure identity. Holds 12 bytes of data.

Filter Value

Numeric, 0-7

Company Prefix

Numeric, 6-12 digits

Asset Type

Numeric, 6-0 digits

The total length of the company prefix + asset type = 12 digits.

Serial Number

Numeric, 0-274 877 906 943

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT>asset type<HT>serial number

RFID Tag Formats: SGLN-64

An SGLN can represent:

- a discrete, unique physical location such as a dock door or a warehouse slot.

- an aggregate physical location such as an entire warehouse.

- a logical entity such as an organization that performs a business function such as placing an order.

The serial number that makes it an SGLN should not be used until specified by the EAN.UCC general specifications. The tag holds 8 bytes of data.

Filter Value

Numeric, 0 to 7

Company Prefix

Numeric, 0-16 383

Location Reference

Numeric, 0-999 999

Serial Number

Numeric, 0-524 287

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT> location reference<HT>serial number

RFID Tag Formats: SGLN-96

An SGLN can represent:

- a discrete, unique physical location such as a dock door or a warehouse slot.

- an aggregate physical location such as an entire warehouse.

- a logical entity such as an organization that performs a business function such as placing an order.

The serial number that makes it an SGLN should not be used until specified by the EAN.UCC general specifications. The tag holds 12 bytes of data.

Filter Value

Numeric, 0 to 7

Company Prefix

Numeric, 6 to 12 digits

Location Reference

Numeric, 0 to 6 digits

The total length of the Company prefix + Location reference = 12 digits.

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT> location reference<HT>serial number

RFID Tag Formats: SGTIN-64

Combines a GTIN and a unique serial number, because a GTIN by itself does not uniquely identify a single physical object. The managing entity is responsible for assigning an SGTIN uniquely to individual object classes. Size of segment is 8 bytes.

Filter Value

Numeric, 0 to 7

Company Prefix

Numeric, 0-16 383

Item Reference

Numeric, 0-1 048 575

Serial Reference

Numeric, 0-33 554 431

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT>item reference<HT>serial number

RFID Tag Formats: SGTIN-96

Combines a GTIN and a unique serial number, because a GTIN by itself does not uniquely identify a single physical object. The managing entity is responsible for assigning an SGTIN uniquely to individual object classes. Size of segment is 12 bytes.

Filter Value

Numeric, 0 to 7

Company Prefix

Numeric, 6 to 12 digits

Item Reference

Numeric, 1 to 7 digits

The total length of the Company Prefix + Item Reference = 13 digits.

Serial Reference

Numeric, 0-274 877 906 943

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT>item reference<HT>serial number

RFID Tag Formats: SSCC-64

SSCC is intended for assignment to individual objects and does not require any additional fields to serve as an EPC pure identity. Size of segment is 8 bytes.

Filter Value

Numeric, 0 to 7

Company Prefix

Numeric, 0-16 383

Serial Reference

Numeric, 0-99 999 999 999

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT>serial reference

RFID Tag Formats: SSCC-96

SSCC is intended for assignment to individual objects and does not require any additional fields to serve as an EPC pure identity. Size of segment is 12 bytes.

Filter Value

Numeric, 0 to 7

Company Prefix

Numeric, 6 to 12 digits

Serial Reference

Numeric, 5 to 11 digits

The total length of the Company Prefix + Serial Reference = 17 digits.

Example for a Fixed Data Field

d3,filter<HT>company prefix<HT>serial reference

RFID Tag Formats: USDOD-64

Department of Defense tag format, including a header, filter, government managed identifier (supplier), and serial number. Tags can store 8 bytes of data.

Filter Value

Numeric, 0–3

Government Managed Identifier

Always 5 characters: 0 to 9, space, and A to Z (except I and O) allowed.

Serial Number

Numeric, 0–16 777 215

Example for a Fixed Data Field

d3,filter<HT>government managed identifier<HT>serial number

RFID Tag Formats: USDOD-96

Department of Defense tag format including a header, filter, government managed identifier (supplier), and serial number. Tags can store 12 bytes of data.

Filter Value

Numeric, 0-15

Government Managed Identifier

Always 5 characters: 8-bit ASCII, 0 to 9, space, and A to Z (except I and O) allowed.

Serial Number

Numeric, 0-68 719 476 735

Example for a Fixed Data Field

d3,filter<HT>government managed identifier<HT>serial number

Preamble, Set

Purpose

Sets the preamble character.

Supported Printers

All

Syntax

<SOH>*n*

Parameters

n

Specifies the preamble character.

n can be any ASCII character.

Default: <NUL>

Note: *When n = <NUL>, the printer does not send a preamble character.*

ASCII TABLES AND INTERNATIONAL CHARACTER SETS

Refer to these ASCII tables to create user-defined fonts:

Full ASCII Table

Full ASCII Control Characters Table

Note: *For international character sets, see your printer user manual.*

Full ASCII Table

Binary[0]	Hex[1]	Decimal	Code 39	ASCII[2]	Binary[0]	Hex[1]	Decimal	Code 39	ASCII[2]
00000000	00	00	%U	NUL	00100011	23	35	/C	#
00000001	01	01	$A	SOH	00100100	24	36	/D	$
00000010	02	02	$B	STX	00100101	25	37	/E	%
00000011	03	03	$C	ETX	00100110	26	38	/F	&
00000100	04	04	$D	EOT	00100111	27	39	/G	'
00000101	05	05	$E	ENQ	00101000	28	40	/H	(
00000110	06	06	$F	ACK	00101001	29	41	/I	)
00000111	07	07	$G	BEL	00101010	2A	42	/J	*
00001000	08	08	$H	BS	00101011	2B	43	/K	+
00001001	09	09	$I	HT	00101100	2C	44	/L	,
00001010	0A	10	$J	LF	00101101	2D	45	/M	-
00001011	0B	11	$K	VT	00101110	2E	46	/N	.
00001100	0C	12	$L	FF	00101111	2F	47	/O	/
00001101	0D	13	$M	CR	00110000	30	48	/P4	0
00001110	0E	14	$N	SO	00110001	31	49	/Q	1
00001111	0F	15	$O	SI	00110010	32	50	/R	2
00010000	10	16	$P	DLE	00110011	33	51	/S	3
00010001	11	17	$Q	DC1	00110100	34	52	/T	4
00010010	12	18	$R	DC2	00110101	35	53	/U	5
00010011	13	19	$S	DC3	00110110	36	54	/V	6
00010100	14	20	$T	DC4	00110111	37	55	/W	7
00010101	15	21	$U	NAK	00111000	38	56	/X	8
00010110	16	22	$V	SYN	00111001	39	57	/Y	9
00010111	17	23	$W	ETB	00111010	3A	58	/Z	:
00011000	18	24	$X	CAN	00111011	3B	59	%F	;
00011001	19	25	$Y	EM	00111100	3C	60	%G	<
00011010	1A	26	$Z	SUB	00111101	3D	61	%H	=

Binary[0]	Hex[1]	Decimal	Code 39	ASCII[2]	Binary[0]	Hex[1]	Decimal	Code 39	ASCII[2]
00011011	1B	27	%A	ESC	00111110	3E	62	%I	>
00011100	1C	28	%B	FS	00111111	3F	63	%J	?
00011101	1D	29	%C	GS	01000000	40	64	%V	@
00011110	1E	30	%D	RS	01000001	41	65	A	A
00011111	1F	31	%E	US	01000010	42	66	B	B
00100000	20	32	SP	SP[3]	01000011	43	67	C	C
00100001	21	33	/A	!	01000100	44	68	D	D
00100010	22	34	/B	"	01000101	45	69	E	E
01000110	46	70	F	F	01100011	63	99	+C	c
01000110	46	70	F	F	01100011	63	99	+C	c
01000111	47	71	G	G	01100100	64	100	+D	d
01001000	48	72	H	H	01100101	65	101	+E	e
01001001	49	73	I	I	01100110	66	102	+F	f
01001010	4A	74	J	J	01100111	67	103	+G	g
01001011	4B	75	K	K	01101000	68	104	+H	h
01001100	4C	76	L	L	01101001	69	105	+I	i
01001101	4D	77	M	M	01101010	6A	106	+J	j
01001110	4E	78	N	N	01101011	6B	107	+K	k
01001111	4F	79	O	O	01101100	6C	108	+L	l
01010000	50	80	P	P	01101101	6D	109	+M	m
01010001	51	81	Q	Q	01101110	6E	110	+N	n
01010010	52	82	R	R	01101111	6F	111	+O	o
01010011	53	83	S	S	01110000	70	112	+P	p
01010100	54	84	T	T	01110001	71	113	+Q	q
01010101	55	85	U	U	01110010	72	114	+R	r
01010110	56	86	V	V	01110011	73	115	+S	s
01010111	57	87	W	W	01110100	74	116	+T	t
01011000	58	88	X	X	01110101	75	117	+U	u
01011001	59	89	Y	Y	01110110	76	118	+V	v

Binary[0]	Hex[1]	Decimal	Code 39	ASCII[2]	Binary[0]	Hex[1]	Decimal	Code 39	ASCII[2]
01011010	5A	90	Z	Z	01110111	77	119	+W	w
01011011	5B	91	%K	[	01111000	78	120	+X	x
01011100	5C	92	%L	\	01111001	79	121	+Y	y
01011101	5D	93	%M	]	01111010	7A	122	+Z	z
01011110	5E	94	%N	^	01111011	7B	123	%P	{
01011111	5F	95	%O	_	01111100	7C	124	%Q	|
01100000	60	96	%W	`	01111101	7D	125	%R	}
01100001	61	97	+A	a	01111110	7E	126	%S	~
01100010	62	98	+B	b	01111111	7F	127	%T[5]	n[6]

Note: [0] Bit positions are 76543210.

[1] Hexadecimal value

[2] ASCII character

[3] SP is the SPACE character.

[4] The Code 39 characters /P through /Y may be interchanged with the numbers 0 through 9.

[5] May be interchanged with %X or %Y or %Z..

[6] n is the DELETE character.

Full ASCII Control Characters Table

Control Character	Control Code	Definition
NUL	^@	Null, or all zeroes
SOH	^A	Start of Heading
STX	^B	Start of Text
ETX	^C	End of Text
EOT	^D	End of Transmission
ENQ	^E	Enquiry
ACK	^F	Acknowledgment
BEL	^G	Bell
BS	^H	Backspace
HT	^I	Horizontal Tab
LF	^J	Line Feed
VT	^K	Vertical Tab
FF	^L	Form Feed
CR	^M	Carriage Return
SO	^N	Shift Out
SI	^O	Shift In
DLE	^P	Data Link Escape
DC1	^Q	Device Control 1 (XON)
DC2	^R	Device Control 2
DC3	^S	Device Control 3 (XOFF)
DC4	^T	Device Control
NAK	^U	Negative Acknowledge
SYN	^V	Synchronous Idle
ETB	^W	End Transmission Block
CAN	^X	Cancel
EM	^Y	End of Medium
SUB	^Z	Substitute
ESC	^[	Escape
FS	^\	File Separator

Control Character	Control Code	Definition
GS	^]	Group Separator
RS	^^	Record Separator
US	^_	Unit Separator
SP	None	Space
DEL	^?	Delete

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