Honeywell

DPL Command Reference

User Guide

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CHAPTER

1

DPL COMMAND REFERENCE

The Datamax Programming Language (DPL) is a feature-rich printer command language designed to print labels, tags and receipts. This Command Reference is for the version of DPL implemented in the Supported Printers table.

This document contains:

Control Code Command Functions

The printer requires a special “attention-getter” character in order to receive a command sequence, informing the printer that it is about to receive a command and the type of command it will be. Control Commands, System-Level Commands, and Font Loading Commands have their own unique attention-getter, followed by a command character that directs printer action.

Supported Printers

Printer Type	Printer Model
Mobile	RP2f, RP4f

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

Attention Getters

The attention-getters (e.g., “SOH”) are standard ASCII control labels that represent a one character control code (i.e., ^A or Ctrl A).

Attention Getter	ACSII Character	Decimal Value	HEX Value
Immediate Commands	SOH	1	01
System-Level Commands	STX	2	02
Front Loading Commands	ESC	27	1B

Easy Control Codes

DPL has been enhanced to accept a 3-character SOH and STX sequence. Easy Control Codes are always enabled, whether in Standard, Alternate, Alternate 2, or Custom Control Code Mode. Two types of sequences have been created to meet any application’s requirements. Use these sequences where you normally would use a single SOH or STX character.

These sequences will not function when the printer input mode is selected to “auto”.

Control Character	3 "%" Character Sequence	3 "^" Character Sequence	Command Type
SOH	%01	^01	Control
STX	%02	^02	System

Alternate Control Code Modes

For systems unable to transmit certain control codes, Alternate Control Code Modes are available. Configuring the printer to operate in an Alternate Control Code Mode (selected via the Setup Menu, the <STX>Kc command or, where applicable, the <STX>KD command) requires the substitution of Standard Control Characters with Alternate Control Characters in what is otherwise a normal data stream.

Control Character	Standard	Alternate	Alternate 2	Custom	Command Type
SOH	0x01	0x5E	0x5E	User Defined	Control
STX	0x02	0x7E	0x7E		System
CR	0x0D	0x0D	0x7C		Line Termination
ESC	0x1B	0x1B	0x1B		Front Loading
"Count By" *	0x5E	0x40	0x40		Label Formatting

*See Label formatting Commands, ^ set count by amount

Note: Throughout this manual <SOH>, <STX>, <CR>, <ESC>, and ^ will be used to indicate control codes. The actual values will depend on whether standard or alternate control codes are enabled for the particular application.

Alternate Line Terminator Example: Alternate Control Codes provide for substitution of the line terminator, as well as the control characters listed above. For example using Alternate 2, the line terminator <CR> (0x0D) is replaced by | (0x7C). The following is a sample label format data stream for a printer configured for Alternate-2 Control Codes:

~L|1911A100010001012345601X|~UT01ABCDE|~G|

Configuration Commands

This command specifies the Power-up Configuration parameter values for the printer and is equivalent to using other system commands followed by the <SOH>U. **This command is intended for easily configuring a custom setup, but NOT for dynamic configuration changes**. Configuration commands are examined for differences relative to the current configuration, and have no impact when no differences exist. Other command highlights include the following:

Note: *Printers will reset upon completion of a command stream containing parameter value changes. No commands should be sent to the printer until this reset is complete.*

- These parameter values are equivalent to changing the respective menu settings and do not affect the factory default settings of the printer.
- If separated by a semi-colon (;), multiple parameter values may be sent in a single command stream; see sample below.
- All values are stored in Flash memory and remain in effect until new values are received or until factory defaults are restored.
- If system commands are sent that override the Power-up Configuration value(s), the Power-up Configuration value(s) will be restored the next time the printer is powered "On" or is reset.
- These parameters are the same as those found in the Menu System (display equipped models). The respective functions are documented in the appropriate Operator's Manual. Not all commands are effective on all printers.

Syntax

<STX>Kcaa1val1[;aalvall][;aanvaln]<CR>

Parameters

Where:

- aa1, aal, aan - Are two letter parameter names.
- val1, vall, valn - Are parameter values, with ranges appropriate for the associated parameter.

Sample

<STX>KcPA120;CL600;STC

Result

The sample above sets the Present Adjust to 120 dots, and the Sensor Type to Continuous with a label length of six inches.

- AS Single Byte Symbol Set
- AV Avalanche
- BP British Pound
- CC Control Codes
- CF Column Adjust Fine Tune
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- PC Print Contrast

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- PM Pause Mode
- pS Print Speed
- QQ Query Configuration
- RF Row Adjust Fine Tune
- RL Ribbon Low Diameter
- RO Row Offset
- SF Save As Filename
- SL Stop Location
- SM Maximum Length Ignore
- SP Serial Port
- ST Sensor Type
- TP TOF Precedence
- UM Unit of Measure

AS Single Byte Symbol Set

This command allows for a default single-byte symbol set. DPL only parameter. Menu Display: "Single Byte Symbol Set"

Parameter	AS
Value / Range:	2 Byte Alpha Character
Units / Interpretation:	AA – ZZ, printer resident symbol set
Command Equivalent:	<STX>y, ySxx

AV Avalanche

This command allows the printer to be configured for the Avalanche utility.

Parameter Pneumonic: AV

Value / Range: See Syntax below

Units / Interpretation: See Syntax below

Command Equivalent: N/A

Syntax:

<stx>KcAV[nnn1,vvvv1:nnn2,vvvv2:...,nnnn,vvvvn:];

Where:

nnni,vvvvi: Configuration Item – Value pairs

nnni Decimal Item Numbers from 1 to 9999, Decimal Item Number Delimiter

vvvvi Item Value (syntax defined later)

: Item Value Delimited terminated

Configuration parameters are defined by the following table.

Item Number	Name	Available to User (Y/N)	Value Type	Description
2	Agent IP Address	Y	String	The IP address of the Avalanche Agent.
3	Agent Port Number	Y	Unsigned short	The TCP/IP port number. Default value is 1777

BP British Pound

This command, when enabled, will automatically switch from the Number symbol (#) found at 0x23 (default PC-850 Multilingual Symbol Set) to\ the British Pound symbol (£) at 0x9C.

DPL only parameter. Menu Display: "Use British Lbs"

Parameter:	BP
Value / Range:	Y, N
Units / Interpretation:	Y = Enabled, N = Disabled
Command Equivalent:	N/A

CC Control Codes

This command, depending upon printer type, allows a change to the prefix of the software commands interpreted by the printer.

DPL Menu Display "Control Code Sets".

Note: There will be no reset after the command, which is different from Datamax-O'Neil DPL printers.

Parameter:	CC
Value / Range:	S,1, 2
Units / Interpretation:	S = Standard, 1 = Alternate, 2 = Alternate-2
Command Equivalent:	N/A

CF Column Adjust Fine Tune

This command fine-tunes the Column Offset setting by shifting both the horizontal start of print position and the Label Width termination point to the right in dots to compensate for slight mechanical differences sometimes evident when multiple printers share label formats.

Parameter:	CF
Value / Range:	+ / – dots
Units / Interpretation:	Resolution specific
Command Equivalent:	N/A

CH Comm Heat Commands

This command causes the printer to ignore DPL Heat commands. Ignore by setting value to N. Process by setting value to Y (default). When set to ignore Heat commands values are controlled via the menu setting.

Parameter:	CH
Value / Range:	Y, N or 1, 0
Units / Interpretation:	Y = Enabled, N = Disabled; or 1 = Enabled, 0 = Disabled
Command Equivalent:	N/A

CL Continuous Label Length

See <STX>c for command details.

Parameter:	CL
Value / Range:	0 - 9999
Units / Interpretation:	1/100 in. or 1/10 mm
Command Equivalent:	<STX>c

If the length value is 1 through 20, Media Type will be set to "Continuous Var Len" and the Label Length will not be changed. In order to be compatible with Datamax-O'Neil printers, the operator will need to have Label Length set larger than the maximum image size being printed prior to setting "Continuous Var Len" mode, otherwise the label will be clipped. Label length value larger than 20 will not affect Media Type and in GAP mode it will only affect the distance used to seek end of the label.

CO Column Offset

See Cnnnn for command details.

Parameter:	CO
Value / Range:	0 - 9999
Units / Interpretation:	1/100 in or 1/10 mm
Command Equivalent:	Cnnnn

Note: *In Honeywell printers, this setting distance reduces Label Width in database, not expected by Datamax-O'Neil users.*

CS Comm Speed Commands

This command causes the printer to ignore DPL speed commands. Ignore by setting value to N. Process by setting value to Y (default). When set to ignore speed values are controlled via the menu setting.

Parameter:	CS
Value / Range:	Y, N or 1, 0
Units / Interpretation:	Y = Enabled, N = Disabled; or 1 = Enabled, 0 = Disabled
Command Equivalent:	N/A

CT Comm TOF Commands

This command causes the printer to ignore DPL TOF (Gap, Continuous, and Reflective) commands. Ignore by setting value to N. Process by setting value to Y (default). When set to DPL TOF values are controlled via the menu setting.

Parameter:	CT
Value / Range:	Y, N
Units / Interpretation:	Y = Enabled, N = Disabled
Command Equivalent:	N/A

DK Darkness

This command adjusts the length of the print head strobe to fine tune the HEAT setting. (Linear mapping Default: DPL 32 = Honeywell 0)

Parameter: DK

Value / Range: 1 - 64

Units / Interpretation: N/A

Notes: Honeywell printers use a different darkness settings range than Datamax-O'Neil printers.

Datamax-O'Neil printers use a range from 1 to 64.

Honeywell printers use an integer range from -10 to 10.

To maintain compatibility with DPL data streams originally intended for use by Datamax-O'Neil printers, this command continues to use the Datamax-O'Neil range but sets the Honeywell darkness setting according to the table below:

DPL	Honeywell printers
1-5	-10
6-11	-8
12-16	-6
17-22	-4
23-28	-2
29-34	0
35-40	2
41-45	4
46-51	6
52-57	8
58-64	10

DM Default Module

See <STX>X for command details.

Parameter:	DM
Value / Range:	A, B, D or G
Units / Interpretation:	Module Letter
Command Equivalent:	<STX>X

Note: *Does not need reset in Honeywell printers but it resets in Datamax-O'Neil DPL printers.*

DS Double Byte Symbol Set

See <STX>y or ySxx for command details.

Parameter:	DS
Value / Range:	2-Byte alpha character
Units / Interpretation:	AA to ZZ printer resident symbol set ID
Command Equivalent:	<STX>y, ySxx

DU Display Units

This command selects the unit of measure for the printer UI displays

Parameter:	Pneumonic DU
Value / Range:	M : Metric, I: Imperial, S: Standard
Units / Interpretation:	N/A
Command Equivalent:	N/A

EC Column Emulation

This command allow the user to set the DPI the printer in the horizontal direction. Default relative TPH density. Effects position and size for lines, boxes and barcodes and positioning for text, images and barcodes. Does not affect image size or text string lengths.

Parameter:	EC
Value / Range:	+/- 100 dots
Units / Interpretation:	dots
Command Equivalent:	N/A

EM Input Mode

This command determines the data processing mode:

Parameter: EM

Value / Range: 0 : DPL 1: Line

Command Equivalent: N/A

Value	Interpretation	Input Mode Interpretation
0	DPL	Character strings are parsed for standard DPL processing.
1	Line	No parsing occurs; instead, each carriage return (<CR>) terminated data line is printed according to a stored template in DPL Programmer's Manual

EN End Character

This command terminates a <STX>Kc string.

Parameter:	EN
Value / Range:	D
Units / Interpretation:	N/A
Command Equivalent:	N/A

ER Row Emulation

This command allow the user to set the DPI the printer in the vertical direction. Default relative TPH density. Effects position and size for lines, boxes and barcodes and positioning for text, images and barcodes. Does not affect image size or text string lengths.

Parameter:	ER
Value / Range:	+/- 100 dots
Units / Interpretation:	dots
Command Equivalent:	N/A

ES ESC Sequences

This command allows data containing invalid ESC control code sequences to be processed (helpful because some systems send a "banner" to the printer). When set to "Disabled," ESC sequences are ignored and the data is processed. Bitmapped font downloads are disabled in this mode.

Parameter:	ES
Value / Range:	Y, N
Units / Interpretation:	Y = Enabled, N = Disabled
Command Equivalent:	N/A

FA Format Attributes

See the "An" command for details.

Parameter:	FA
Value / Range:	X, O, T
Units / Interpretation:	X = XOR, O = Opaque, T = Transparent
Command Equivalent:	An

FH Fault Handling

This command determines the level of user intervention and the disposition of the label being printed when a fault condition (ribbon out, media out, etc.) occurs.

Parameter: Pneumonic FH

Value / Range: L

Units / Interpretation: 0 = No Reprint, 1 = Standard

Command Equivalent: N/A

Value	Units/Interpretation	Selection/Definition
L	0 = No Reprint	Printing stops and a fault message is displayed. After the problem is corrected, the label in process is not reprinted.
	1 = Standard	This is the default behavior. Printing stops and a fault message is displayed. After the problem is corrected. The label in process is reprinted.

FM Feedback Mode

See <STX>a for command details.

Parameter:	FM
Value / Range:	Y, N
Units / Interpretation:	Y = Enabled, N = Disabled
Command Equivalent:	<STX>a

HC Head Cleaning

This command controls the print head cleaning routine. The entered value specifies the inch (or centimeter) count to reach before prompting a print head cleaning. If the number specified is exceeded three times, the printer will fault until cleaning is initiated.

Parameter:	Pneumonic HC
Value / Range:	0 - 9999
Units / Interpretation:	Inches (or centimeters) multiplied by 1000
Command Equivalent:	N/A

HE Heat

See Hnn for command details.

Parameter:	HE
Value / Range:	0.0 – 30.0
Units / Interpretation:	N/A

Note: *Honeywell printers use a different heat settings range than Datamax-O'Neil printers.*

Datamax-O'Neil printers use a decimal range from 0.0 to 30.0.

Honeywell printers use an integer range from 0 to 100.

To maintain compatibility with DPL data streams originally intended for use by Datamax-O'Neil printers, this command continues to use the Datamax-O'Neil range but sets the Honeywell heat setting according to these formulas:

For incoming settings <23, it is multiplied by 3.3 to arrive at the new Honeywell heat setting.

For incoming settings >=23, the Honeywell heat setting is set to 100. The default heat setting for Honeywell printers is 56.

IC Ignore Control Codes

This command allows the user to remove control codes (< 20 Hex) in the data field. The selected line terminator is processed. When enabled, DPL Control Code (SOH, STX, CR, ESC, and ^) characters are removed from the data string. (Note that some fonts do have printable characters in this range and they will not be printed when enabled.)

Parameter:	IC
Value / Range:	Y, N or 1, 0
Units / Interpretation:	Y = Enabled, N = Disabled; or 1 = Enabled, 0 = Disabled
Command Equivalent:	N/A

IP Process SOH (Data)

Whether to allow SOH processing.

Parameter:	IP
Value / Range:	E, Y, D, N
Units / Interpretation:	Enable/Disable
Command Equivalent:	N/A

LM Label Store

This command selects the level of stored format recall to include the label-formatting command fields, or the label-formatting command fields and the printer state.

Parameter:	LM
Value / Range:	F, S
Units / Interpretation:	F = Fields, S = States & Fields
Command Equivalent:	N/A

LR Label Rotation

This command sets label rotation, allowing formats to be flipped 180 degrees. DPL Menu Display "Label Rotation"

Parameter:	LR
Value / Range:	Y, N
Units / Interpretation:	Y = Rotate 180, N = None
Command Equivalent:	N/A

LS Language Select

This command selects the language for the menu system messages and configuration label. Only languages that are resident will be available. (Language name limited to a twenty character maximum.)

Parameter:	Pneumonic LS
Value / Range:	Ascii Characters
Units / Interpretation:	N/A
Command Equivalent:	N/A

For the language name, user can input FIJI supported language name in English or file name in the DPL language list below :

FRANCAIS.DLN

FRANCAIS20.DLN

ITALIANO.DLN

ITALIANO20.DLN

DEUTSCH.DLN

DEUTSCH20.DLN

ESPAÑOL.DLN

ESPAÑOL20.DLN

Portuguese.DLN

Chinese.DLN

Note: *For Chinese.DLN, it will be mapped to language "Chinese (Simplified)".*

LW Label Width

This command sets the maximum limit for the printable width. Objects extending beyond this limit will NOT print;

Parameter:	LW
Value / Range:	0075 – head width
Units / Interpretation:	1/100 in. or 1/10mm
Command Equivalent:	<STX>KW

MT Media Type

This command selects the printing method: Direct Thermal for use with heat sensitive media or Thermal Transfer for use with media requiring a ribbon to create an image.

Parameter:	CL
Value / Range:	D, T
Units / Interpretation:	D = Direct, T = Thermal Transfer
Command Equivalent:	N/A

NS Disable Symbol Set Selection

This command set the printer to ignore any DPL symbol set selection commands

Parameter:	NS
Value / Range:	Y, N
Units / Interpretation:	Y = Enabled, N = Disabled
Command Equivalent:	N/A

PC Print Contrast

This command adjusts the relative print edge (gray) component of the print quality, which allows fine-tuning for specific media/ribbon mix.

Parameter:	Pneumonic PC
Value / Range:	0 - 64
Units / Interpretation:	N/A
Command Equivalent:	N/A

PD Present Distance

This command sets the label stop position past the start of print. When the next label format is received, the printer will automatically backfeed to the start position. If the present distance is set to zero, the printer will operate without reversing.

Parameter:	PD
Value / Range:	0 – 400
Units / Interpretation:	1/100 inch
Command Equivalent:	<STX>Kf

PE Peel Mode

This command, when enabled, specifies that a Feed operation be prevented when the label is presented and not removed.

Parameter:	Pneumonic PE
Value / Range:	Y, N
Units / Interpretation:	Y= Enabled; N= Disabled
Command Equivalent:	<STX>y, ySxx

PM Pause Mode

See <STX>J for command details.

Parameter:	PM
Value / Range:	Y, N
Units / Interpretation:	Y = Enabled, N = Disabled
Command Equivalent:	<STX>J

pS Print Speed

See command Pa (Print Speed Mnemonic Table) for details.

Parameter:	pS
Value / Range:	Alpha Character
Units / Interpretation:	Model specific ranges
Command Equivalent:	Pa

Note: *Only full IPS speeds implemented.*

QQ Query Configuration

This command requires a parameter of either K or Q.

K causes the printer to respond with the Printer Key, used for generating Upgrade Codes. A parameter value of Q causes the printer to respond with the current configuration settings. The <STX>Kc response command stream format is sent to the host computer via the same port as the query containing all parameters controlled by the <STX>Kc command, and may be used for restoring the printer's configuration or for configuring other printers.

Parameter:	QQ
Value / Range:	Q or K
Units / Interpretation:	N/A
Command Equivalent:	N/A

RF Row Adjust Fine Tune

This command shifts the vertical start of print position in dots upward or downward.

Parameter:	RF
Value / Range:	+ / – dots
Units / Interpretation:	Resolution specific
Command Equivalent:	N/A

RL Ribbon Low Diameter

This command sets the threshold for a low ribbon indication, where nnnn is the diameter in hundredths of inches.

Parameter:	Pneumonic RL
Value / Range:	100 - 200
Units / Interpretation:	1/100 in or 1/10 mm
Command Equivalent:	N/A

RO Row Offset

See Rnnnn for command details. DPL only parameter.

Parameter:	RO
Value / Range:	0 - 9999
Units / Interpretation:	1/100 in. or 1/10 mm
Command Equivalent:	Rnnnn
DPL Menu Display:	"Row Offset"

SF Save As Filename

This command, which may be sent separately or included as the last command in an <STX>Kc command string, saves the effective printer configuration to a file in Flash memory with a .dcm file extension.

Parameter:	Pneumonic SF
Value / Range:	Alphanumeric string
Units / Interpretation:	Up to 16 characters
Command Equivalent:	N/A

SL Stop Location

This command sets the label stopping (and in certain cases the starting) location.

Parameter:	SL
Value / Range*:	A, H, P, C, T, N
Units / Interpretation:	Auto, Host, Peel, Cut, Tear, None
Command Equivalent:	N/A

* Only T is supported currently.

(SL) Stop Location – This command sets the label stopping (and in certain cases the starting) location, as follows:

Value	Stop Location
A	Automatically sets the stop location. Installed options will be "auto-sensed" and the appropriate stop position will automatically be set. Host commands are ignored.
H	Sets stop position according to options installed. If no options are installed the printer sets stop location to the next label's start of print. Host commands will override. The stop location (present distance) may be controlled dynamically by the host using the <STX>f or <STX>Kf commands. This selection has the same effect as <STX>KD Ignore Host Distance bit value 0.
P	Sets the stop location at approximately two millimeters behind the peel bar edge, a nominal peel position. The Present Sensor status and this setting are independent.
C	Sets the stop location to a nominal cut position. For die-cut media, the position is just following the end of the label. The cutter status and this setting are independent.
T	Sets the stop location at the tear bar.
N	Sets the stop location to the start of the next label, equivalent to setting the <STX>KD Ignore Host Distance bit value 1.

Stop Location Settings on Controls:

- Host – Ignore.
- Peel - Ignore.
- Cut - Ignore.
- Tear - sets the Print Mode to Tear Off.
- None - Ignore.

- Auto - sets the after print distance based on the option that is equipped (cut/tear/peel).

Present Distance:

- Parameter in the NV database set by UI and KcPD and can be overridden by Kf if Stop location is Host.
- 0 = Auto and control by Stop Location; > 0 override Stop Location and is actual present distance.

SM Maximum Length Ignore

This command controls recognition of the <STX>M command.

Parameter:	SM
Value / Range:	0 , 1
Units / Interpretation:	0 = Normal processing, 1 = Ignore
Command Equivalent:	N/A

SP Serial Port

This command configures the serial communication port(s).

Parameter: Pneumonic SP

Value / Range: xyz

Units / Interpretation: Various

Command Equivalent: N/A

Value		Serial Port Range		
xyz	Where:	x = Port Identifier	y = Function	z = Setting
		A. - Serial A B. - Serial B	P - Handshaking Protocol	B - both H - hardware N - none S - software
			P - Parity	E - even N - none O - odd
			D - Data Length	7 - eight bits 8 - seven bits
			S - Stop Bits	1 - one bit 2 - two bits
xyzz	Where:	x = Port Identifier	y = Function	zz = Setting
		A. - Serial A B. - Serial B	B - Baud Rate	12 - 1200 24 - 2400 48 - 4800 96 - 9600 19 - 19200 28 - 28800 38 - 38400 57 - 57600 15 - 115200

ST Sensor Type

Sets sensor type.

Parameter:	ST
Value / Range:	G, C, R
Units / Interpretation:	G = Gap (edge), C = Continuous, R = Reflective
Command Equivalent:	<STX>e, <STX>r, <STX>c

TP TOF Precedence

This command instructs the firmware to stop printing at the first top of form mark it detects. The default ("No") prints all of the data (traversing the top of form as necessary) then slews to the next TOF.

Parameter:	TP
Value / Range:	Y, N
Units / Interpretation:	Y = Enabled, N = Disabled
Command Equivalent:	N/A

UM Unit of Measure

See <STX>m (metric) or <STX>n (imperial) for command details.

Parameter:	UM
Value / Range:	M, I
Units / Interpretation:	M = Metric, I = Imperial
Command Equivalent:	<STX>m, <STX>n

Format Record Commands

Format Records are data strings containing the data to be printed on the label(s) preceded by instructions for how it is to be printed. These records are the building blocks of label formats. Each record is made up of three parts:

1. A header
2. Data to be printed
3. An end-of-field termination character

There are six field types:

1. Internal bitmap fonts
2. Smooth fonts
3. Scalable fonts
4. Barcodes
5. Images
6. Graphics (lines, boxes, etc.)

See Format Record Structure for definitions of how these records are constructed for each of the six field types.

Format Record Structure

Format records (with spaces between fields added here for readability – the actual data stream cannot contain spaces between fields) conforms to the following fixed-length field format. Identifying lower case letters have been placed below field values for reference in the following sections:

a b[b[b]] c d eee ffff gggg [hhhh iiii] jj...j Termination character

Location Within Record	Internal Bitmapped Font	Smooth Font	Scalable Font	Barcode	Images	Graphics
a	Rotation	Rotation	Rotation	Rotation	Rotation	1
b[b[b]]	Font ID	9	9	Barcode	Y	X
c	Width Multiplier	Width Multiplier	Width Multiplier	Wide Bar	Width Multiplier	1
d	Height Multiplier	Height Multiplier	Height Multiplier	Narrow Bar	Height Multiplier	1
eee	000	Font Size/ID	ID	Barcode Height	000	000
Ffff	Row Position	Row Position	Row Position	Row Position	Row Position	Row Position
gggg	Column Position	Column Position	Column Position	Column Position	Column Position	Column Position
hhhh	N/A	N/A	Font Height	N/A	N/A	N/A
iiii	N/A	N/A	Font Width	N/A	N/A	N/A
jj...j	Data String	Data String	Data String	Data String	Image Name	Graphics Specifier

The record structure is shown for each of the record types. The left-most column shows the locations of all characters in the record, and corresponds to the example above the table. Each record structure interprets the characters of the record in its own way, though some of the interpretations of the characters are identical across all record types. For example, the characters ffff are interpreted as Row Position in all record types. While c is a Width Multiplier for Internal Bitmapped Font, Smooth Font, Scalable Font, and Image record types, it has other interpretations for Barcode and Graphics record types.

The following table defines the allowed values and their meanings for each field type.

Field Type	Allowed Values
a (Rotation)	1=0° upright; 2=90° clockwise; 3=180°; 4=270° clockwise
b[b[b]] (Field Type)	See individual field types below for allowed values
c (Width multiplier)	1=100% width; 2=200%; 3=300%; to a maximum of z=62x 100% width
d (Height multiplier)	Same as "c" for height
eee	See individual field types below for allowed values
ffff	Row position. Depends on system units value: If Imperial, 1/100ths of inches (1234 is 12.34 inches) If metric, 1/10ths of millimeters (1234 is 123.4mm)
gggg	Column position. Same as "ffff" for row position.
hhhh	See individual field types below for allowed values
iiii	See individual field types below for allowed values
data	Data to be printed; for Images the name of the graphic to be saved; for Graphics, a specifier

Internal Bitmapped Font

This record type is used for internal bitmapped fonts.

Syntax

abcd eee ffff gggg jj...j <CR>

Parameters

Where:

Field	Valid Inputs	Meaning
a	1, 2, 3 and 4	Rotation
b	0 to 8	Font
c	1 to 9, A to Z, and a to z	Width Multiplier
d	1 to 9, A to Z, and a to z	Height Multiplier
eee	000	N/A
ffff	0000 to 9999	Row
gggg	0000 to 9999 Dependent upon printer.	Column
jj...j	Valid ASCII character string up to 255 characters, followed by a termination character.	Data

Behavior

When a 0 through 8 is entered in field b, then the height field eee is not used. The bitmapped fonts include 8 different fonts.

Valid characters:

Font Number	Valid ASCII Characters (decimal)
0	32-127, 255
1	32-168, 171, 172, 225, 255
2	32-168, 171, 172, 225, 255
3	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255

Font Number	Valid ASCII Characters (decimal)
4	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
5	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
6	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
7	32-126
8	32, 48-57, 60, 62, 67, 69, 78, 83, 84, 88, 90

Font Sizes:

Font sizes are dependent upon the print head resolution of the printer used. The tables below contain a listing of the font sizes by resolution with dimensions given in dots.

203 DPI:

Font	Height	Width	Spacing	Point Size
Font 0	7	5	1	2.5
Font 1	13	7	2	4.6
Font 2	18	10	2	6.4
Font 3	27	14	2	9.6
Font 4	36	18	3	12.8
Font 5	52	18	3	18.4
Font 6	64	32	4	22.7
Font 7	32	15	5	11.3
Font 8	28	15	5	9.9

300 DPI:

Font	Height	Width	Spacing	Point Size
Font 0	10	7	1	2.4
Font 1	19	10	3	4.6
Font 2	27	15	3	6.5
Font 3	40	21	3	9.6
Font 4	53	27	4	12.7

Font	Height	Width	Spacing	Point Size
Font 5	77	27	4	18.5
Font 6	95	47	6	22.8
Font 7	47	22	7	11.3
Font 8	41	22	7	9.8

600 DPI:

Font	Height	Width	Spacing	Point Size
Font 0	20	14	2	2.4
Font 1	38	20	6	4.6
Font 2	54	30	6	6.5
Font 3	80	42	6	9.6
Font 4	106	54	8	12.7
Font 5	154	54	8	18.5
Font 6	190	94	12	22.8
Font 7	94	44	14	11.3
Font 8	82	44	14	9.8

Smooth/Downloaded Bitmapped Fonts

This record type is used for internal smooth fonts (CG Triumvirate) or a bitmapped font downloaded to a memory module; see Font Loading Commands.

Syntax

abcd eee ffff gggg jj...j <CR>

Parameters

Where:

Field	Valid Inputs	Meaning
a	1, 2, 3 and 4	Rotation
b	9	Font
c	1 to 9, A to Z, and a to z	Width Multiplier
d	1 to 9, A to Z, and a to z	Height Multiplier
eee	000	N/A
ffff	0000 to 9999	Row
gggg	0000 to 9999 Dependent upon printer.	Column
jj...j	Valid ASCII character string up to 255 characters, followed by a termination character.	Data

Behavior

When a 9 is entered in field b, then the height field eee determines the font. The internal smooth font has up to 13 font sizes. Values 100 through 999 select individual fonts stored on DRAM, or Flash memory. These include downloaded bitmapped fonts. Use eee values of 096 – 099 for Kanji fonts, if equipped.

Valid characters

- Dependent upon selected symbol set

Font sizes

Point Size	203 DPI Syntax	300, 600 DPI Syntax	0nn Syntax
4	-	A04	-
5	-	A05	000
6	A06	A06	001
8	A08	A08	002
10	A10	A10	003
12	A12	A12	004
14	A14	A14	005
18	A18	A18	006
24	A24	A24	007
30	A30	A30	008
36	A36	A36	009
48	A48	A48	010
72	-	A72	-

Scalable Fonts

Microtype, Monotype, and TrueType (.TTF) Scalable Font file formats are supported. The eee field identifies the scalable font, and data type – normal (binary) or Hex ASCII. Uppercase S or U – binary, lowercase u – Hex ASCII. Values S00 to S9z, and U00 to U9z (u00 to u9z), select a scalable font. S00, S01 and SAx are used for the standard internal (resident) fonts.

Syntax

abcd eee ffff gggg jj...j <CR>

Parameters

Where:

Field	Valid Inputs	Meaning
a	1, 2, 3 and 4	Rotation
b	9	Font
c	1 to 9, A to Z, and a to z	Width Multiplier
d	1 to 9, A to Z, and a to z	Height Multiplier
eee	000	N/A
ffff	0000 to 9999	Row
gggg	0000 to 9999 Dependent upon printer.	Column
jj...j	Valid ASCII character string up to 255 characters, followed by a termination character.	Data

Behavior

Single and Double Byte Character Font Mapping

Font Name	Character Mapping	Font Size Specifier (eee Height)	Point Size
CG Triumvirate Bold Condensed	Single Byte	S00	scalable
CG Triumvirate	Single Byte	S01	scalable
CG Times	Single Byte	SA0	scalable

Font Name	Character Mapping	Font Size Specifier (eee Height)	Point Size
CG Times Italic	Single Byte	SA1	scalable
CG Times Bold	Single Byte	SA2	scalable
CG Times Bold Italic	Single Byte	SA3	scalable
Gothic B Kanji	Double Byte (Binary)	U40	scalable
Gothic B Kanji	Double Byte (Hex ASCII)	u40	scalable
GB Simplified Chinese	Double Byte (Binary)	UC0	scalable
GB Simplified Chinese	Double Byte (Hex ASCII)	uC0	scalable
Korean Hangul	Double Byte (Binary)	UH0	scalable
Korean Hangul	Double Byte (Hex ASCII)	uH0	scalable
User-downloaded typeface	Single Byte (Binary)	S50 - S5z..., S90 - S9z	scalable
User-downloaded typeface	Double Byte (Binary)	U50...,U5z..., U90...U9z	scalable
User-downloaded typeface	Double Byte (Hex ASCII)	u50...,u5z..., u90...u9z	scalable

Scalable Font 00: CG Triumvirate Bold Condensed (Resident)

CG Triumvirate Bold Condensed. Single Byte Scalable Font ID S00. This is a resident embedded Scalable Font.

Scalable Font 01: CG Triumvirate (Resident)

CG Triumvirate: Single Byte Scalable Font ID S01. This is the default resident embedded Scalable Font.

Scalable Font A0: CG Times (Resident)

CG Times: Single Byte Scalable Font ID SA0. This font is resident.

Scalable Font A1: CG Times Italic (Resident)

CG Times Italic: Single Byte Scalable Font ID SA1. This font is resident.

Scalable Font A2: CG Times Bold (Resident)

CG Times Bold: Single Byte Scalable Font ID SA2. This font is resident.

Scalable Font A3: CG Times Bold Italic (Resident)

CG Times Bold Italic: Single Byte Scalable Font ID SA3. This font is resident.

User Downloaded Single Byte Scalable typeface (Binary ID’s S50 – S5z..., S90 – S9z)

User Downloaded Single Byte (Binary) Scalable ID's S50 - S5z..., S90 - S9z

User-downloaded Double Byte Scalable Typeface (Binary ID’s U50..., U5z..., U90...U9z)

User Downloadable Double Byte (Binary) Scalable ID's U50..., U5z..., U90...U9z

User Downloaded Double Byte Scalable typeface (Hex Ascii ID’su50..., u5z..., u90...u9z)

User Downloaded Double Byte (Hex ASCII) Scalable ID's u50..., u5z..., u90...u9z

DPL to FIJI font mapping

Scalable Font H0: Korean Hangul (Downloaded / Embedded)

Scalable Font 40: Gothic B Kanji (Downloaded / Embedded)

Scalable Fonts C0: Simplified GB Chinese (Downloaded /Embedded)

Scalable Font T0: Traditional Chinese (Downloaded / Embedded)

DPL Font Mapping

Name	Type	DPL Font ID	DPL Symbols	Code Page	Fonts	Comments
Japanese	double byte	U40/u40	SJ	932	TBMinPro-Light	
GB Simplified Chinese	double byte	UC0/uC0	GB	936	MHeiGB18030C-Medium	Use MHei as default font for DPL
Korean	double byte	UH0/uH0	UC	UTF-16BE	HYGoThic-Medium	
Traditional Chinese	double byte	No Default	B5	950	MSung HK Medium	Create a default font ID. e.g. UT0 / uT0

Images

An image record is used to print an image that is stored in a memory module. Images can be printed only in Rotation 1; see <STX>I.

Syntax

abcd eee ffff gggg jj...j <CR>

Parameters

Where:

Field	Valid Inputs	Meaning
a	1	Rotation
b	Y	Image
c	1 to 9, A to Z, and a to z	Width Multiplier
d	1 to 9, A to Z, and a to z	Height Multiplier
eee	000	Fixed
ffff	0000 to 9999	Row
gggg	0000 to 9999 Dependent upon printer.	Column
jj...j	ASCII string, up to 16 characters followed by a termination character.	Image Name

Limitations:

The supported graphic types are:

- 7-bit Datamax-O'Neil image load file
- BMP 8-bit format, flipped, black and white (B&W)
- BMP 8-bit format, B&W
- IMG 8-bit format, flipped, B&W
- IMG 8-bit format, B&W
- PCX 8-bit format, flipped, B&W
- PCX 8-bit format, B&W
- RLE-2 8-bit format, B&W

Lines and Boxes

Lines and boxes are drawn by values that determine column and row starting position, length, width, and wall thickness of the line or box. Depending on the printer's mode, all measurements are interpreted as inches/100 or millimeters/10 (see <STX>m). The data field jj...j is used to describe the line or box dimensions.

Syntax

abcd eee ffff gggg jj...j <CR>

Parameters

Where:

Field	Valid Inputs	Meaning
a	1	Fixed Value
b	X	Line / Box
c	1	Fixed Value
d	1	Fixed Value
eee	000	Fixed Value
ffff	0000 to 9999	Row
gggg	0000 to 9999	Column
jj...j	Lhhhvvv lhhhhvvvv Bhhhvvvbbbsss bhhhhvvvvbbbbssss	Line* Line** Box*** Box****

Line*: Lhhhvvv

Where:

- L = "L" and specifies line drawing;
- hhh= horizontal width of line;
- vvv = vertical height of line.

Line**: lhhhhvvvv

Where:

- l = "l" and specifies line drawing;
- Hhhh = horizontal width of line;

- vvvv = vertical height of line.

Box***: Bhhhvvvbbbsss

Where:

- B = "B" and specifies box drawing;
- Hhh = horizontal width of box;
- vvv = vertical height of box;
- bbb = thickness of bottom and top box edges;
- sss = thickness of box sides.

Box****: bhhhhvvvvbbbbssss

Where: b = "b" and specifies box drawing;

- hhhh = horizontal width of box;
- vvvv = vertical height of box;
- bbbb = thickness of bottom and top box edges;
- ssss = thickness of box sides

Behavior

- Boxes fill/grow "in" from the bounding box

Polygons

Polygons are created by defining the positions of the corners, specifying a number of data points that represent the vertices of the object, which can range from a simple line (two points), or a triangle (three points), to any free-form outline. All row/column specifiers are interpreted as inches/100 or millimeters/10 depending on the printer mode, (see <STX>m).

Syntax

1 X 11 ppp rrrr cccc P ppp bbbb rrrr cccc rrrr cccc ... <CR>

Parameters

Field	Valid Inputs	Meaning
1	1	Fixed Value
X	X	Polygon
1	1	Fixed Value
1	1	Fixed Value
rrrr	0000 to 9999	Row of point 1
cccc	0000 to 9999	Column of point 1
P	Polygon ID	Fixed Value
ppp	001	Fixed Value
bbbb	0001	Fixed Value
rrrr	0000 to 9999	Row of point 2
cccc	0000 to 9999	Column of point 2
rrrr	0000 to 9999	Row of point 3
cccc	0000 to 9999	Column of point 3
...	...	Additional points
<CR>	Termination character	Termination character

Sample

1X1100000100010P001000100400025001000040

Result

Produces a triangle with no fill pattern.

Limitations

Fill Patterns not yet supported.

Circles

A circle is created by defining by its center point and radius. Row, column, and radius are interpreted as inches (100) or millimeters (10) depending on printer mode. Record structure for a circle (spaces have been added for readability):

Syntax

1 X 11 fff rrrr cccc C ppp bbbb rrrr <CR>

Parameters

Where:

Field	Valid Inputs	Meaning
1	1	Fixed Value
X	X	Circle
1	1	Fixed Value
1	1	Fixed Value
fff	000	No Fill Pattern
rrrr	0000 to 9999	Row of the center point
cccc	0000 to 9999	Column of the center point
C	Circle ID	Fixed Value
ppp	001	Fixed Value
bbbb	0001	Fixed Value
rrrr	0000 to 9999	Radius of the circle
<CR>	Termination character	Termination character

Sample record

1X1100001000100C00100010025<CR>

Result

Produces a circle centered at row 0100, column 0100 with a radius of 0025 and no fill pattern.

Limitations

Fill pattern is not yet supported

Barcode

Barcode Format Record commands (listed below) consist of all the data used to specify which barcode is to be formatted and the data to be encoded or printed. The Barcode IDs in the data have an alpha designator. Uppercase designators print barcodes with human-readable interpretations, if supported; lowercase specifies barcodes without. Place the ID in field b of the Format Record header to cause the printer to encode the data field using the associated symbology.

- W1C DataMatrix Barcode with Byte Count Specifier
- W1d / W1D QR Code Barcode
- W1f / W1F Aztec Barcode
- W1I EAN128 Barcode (with Auto Subset Switching)
- W1J Code 128 Barcode (with Auto Subset Switching)
- W1k GS1 DataBar Barcode
- W1k GS1 DataBar Undercut
- W1L Planet Code Barcode
- W1N-W1n Industrial 2 of 5 Barcode
- W1p Intelligent Mail Barcode (IMB)
- W1s-W1S Standard 2 of 5 Barcode
- W1Y-W1y Code 16K Barcode
- W1z MicroPDF417 Barcode
- W1Z Micro PDF417 Barcode with Byte Count Specifier

Valid inputs for the barcode field b are letters: uppercase letters will print a human readable text below the barcode; lowercase letters will only print the barcode. For example, entering a "p" in the b field selects the Postnet barcode. Because the Postnet font does not provide human-readable data, the uppercase P is not valid. Other barcodes without a human-readable counterpart include u (MaxiCode) and z (PDF417).

For module-based barcodes, field d is the narrow bar width in dots (barcode module size). For consistent results in all rotations for barcodes of this type, field d and field c must have the same value. For ratio-based barcodes, field c is the wide bar width in dots (the numerator); field d is the narrow bar width in dots (the denominator).

The eee height field represents the barcode (symbol) height. The valid range (001 to 999) translates to bar heights ranging from .01 inch (.254 mm) to 9.99 inches (253.7 mm). For barcodes that require additional specified parameters, use the jj...j data field as the location for these parameters.

Syntax

abcd eee ffff gggg jj...j <CR>

Parameters

Where:

Field	Valid Inputs	Meaning
a	1, 2, 3 and 4	Rotation (see Format Record Structure for rotation definitions)
b[b[b]]	A-Z, a-z P, u, v, z unused	Barcode Symbology Designator
c	1 to 9, A to Z, and a to z	Wide Bar
d	1 to 9, A to Z, and a to z	Narrow Bar
eee	001 to 999	Symbol Height
ffff	0000 to 9999	Row
gggg	0000 to 9999 Dependent upon printer.	Column

Field	Valid Inputs	Meaning
jj...j	Valid ASCII character string up to 255 characters, followed by a termination character.	Data

Barcode Summary Data

Barcode fonts have alpha names (left column, below). Uppercase alpha names will print barcodes with human-readable interpretations, if supported. Lowercase alpha names will print barcodes only. Place the ID in field b of the Format Record header to cause the printer to encode the data field using the associated symbology.

Barcode ID	Symbology	Length	Checksum	Valid ASCII Characters, decimal value representation
A / a	Code 39	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90
B / b	UPC-A	11	Yes	48-57 Numeric only. Option V used in the 6th & 7th position
C / c	UPC-E	6	Yes	48-57 Numeric only
D / d	Interleaved 2 of 5 (I2 of 5)	Varies	No	48-57 Numeric only
E / e	Code 128	Varies	M-103	32-127
F / f	EAN-13	12	Yes	48-57 Numeric only. Option V used in 7th & 8th position
G / g	EAN-8	7	Yes	48-57 Numeric only
H / h	HIBC	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90
I / i	Codabar	Varies	No	36, 43, 45-58, 65-68
J / j ü	Interleaved 2 of 5 w/ a modulo 10 checksum	Varies	M-10	48-57 Numeric only
K / k	Plessey	Up to 14	M-10	48-57 Numeric only. Option + is last character for 2nd M-11 chksum
L / l	Interleaved 2 of 5 w/ modulo 10 checksum & bearer bars	13	M-10	48-57 Numeric only
M / m	2 digit UPC addendum	2	Yes	48-57 Numeric only
N / n	5 digit UPC addendum	5	Yes	48-57 Numeric only

Barcode ID	Symbology	Length	Checksum	Valid ASCII Characters, decimal value representation
O / o	Code 93	Varies	No	35-38, 42-58, 65-90, 97-122
p	Postnet	Varies	Yes	48-57 Numeric only
Q / q	UCC/EAN 128	19	Yes	48-57 Numeric only
R / r	UCC/EAN 128 K-Mart non-EDI	18	Yes	48-57 Numeric only
S / s ü	UCC/EAN 128 Random Weight	34 +	Yes	48-57 Numeric only
T / t	Telepen	Varies	Yes	All ASCII characters
U	UPS MaxiCode	84	Yes	Alphanumeric
u	UPS MaxiCode w/ Byte Count	Specified	Yes	Alphanumeric
v	FIM	1	No	A, B, C, D
z	PDF417	Varies	Yes	All
Z	PDF417 w/ Byte Count	Specified	Yes	All
W1c	DataMatrix	Varies	Yes	All 8-bit values
W1C	DataMatrix w/ Byte Count	Specified	Yes	All 8-bit values
W1d	QR Code – Auto format	Varies	Yes	Alphanumeric
W1D	QR Code – Manual format	Varies	Yes	Single-byte or Kanji double-byte
W1f	Aztec	Varies	Yes	All 8-bit values
W1F	Aztec w/ Byte Count	Specified	Yes	All 8-bit values
W1G / W1g	USD-8 (Code 11)	Varies	Yes	45, 48-57
W1I	EAN 128 w/auto subset switching	Varies	Yes	32-127

Barcode ID	Symbology	Length	Checksum	Valid ASCII Characters, decimal value representation
W1J ü	Code 128 w/auto subset switching	Varies	Yes	32-127
W1k	GS1 DataBar (six types)	Varies	Yes	Numeric / Alphanumeric (type dependent)
W1L	Planet Code	Varies	Yes	48-57 Numeric only
W1M / W1m	Australia Post 4-State Barcode	Varies	Yes	Numeric / Alphanumeric (type dependent)
W1N / W1n	Industrial 2 of 5	Varies	M-10	48-57 Numeric only
W1p	Intelligent Mail Barcode (IMB)	Varies	No	48-57 Numeric only
W1q	CODABLOCK	Varies	Yes	32, 36, 37, 42, 43, 45-57, 65-90 / All ASCII characters (type dependent)
W1R	UCC/EAN Code 128 K-MART NON EDI	18	Yes	48-57 Numeric only
W1S / W1s	Standard 2 of 5	Varies	M-10	48-57 Numeric only
W1t	TCIF Linked 3 of 9 (TLC39)	Varies	Yes	Alphanumeric
W1Y / W1y	Code 16K	Varies	Yes	All ASCII characters
W1z	MicroPDF417	Varies	Yes	All 8-bit value
W1Z	W1Z MicroPDF417 w/ Byte Count	Specified	Yes	All 8-bit values

Barcode Default Widths and Heights

Font	203 DPI Height (inches)	203 DPI Ratio / Module Size	300 DPI Height (inches)	300 DPI Ratio / Module Size	600 DPI Height (inches)	600 DPI Ratio / Module Size
A	.40	6:2	.40	9:4	.40	18:6
B	.80	3	.80	4	.80	9
C	.80	3	.80	4	.80	9
D	.40	5:2	.40	9:4	.40	15:6
E	.40	2	.40	4	.40	6
F	.80	3	.80	4	.80	9
G	.80	3	.80	4	.80	9
H	.40	6:2	.40	9:4	.40	18:6
I	.40	6:3	.40	9:4	.40	18:6
J	.40	5:2	.40	9:4	.40	15:6
K	.40	5:2	.40	9:4	.40	15:6
L	1.30	5:2	1.30	9:4	1.30	15:6
M	.90	3	.90	4	.90	9
N	.80	3	.80	4	.80	9
O	.40	6:3	.40	8:4	.40	18:9
p	.08	N/A	.08	N/A	.08	N/A
Q	1.40	2	1.40	4	1.40	6
R	1.40	2	1.40	4	1.40	6
S	1.40	2	1.40	4	1.40	6
T	.80	1	.80	1	.80	3
U/u	1.00	N/A	1.00	N/A	1.00	N/A
v	.50	1	.50	1	.50	3
z	N/A	N/A	N/A	N/A	N/A	N/A
Z	N/A	N/A	N/A	N/A	N/A	N/A
W1C/W1c	N/A	N/A	N/A	N/A	N/A	N/A
W1D/W1d	N/A	N/A	N/A	N/A	N/A	N/A
W1F/W1f	N/A	N/A	N/A	N/A	N/A	N/A

Font	203 DPI Height (inches)	203 DPI Ratio / Module Size	300 DPI Height (inches)	300 DPI Ratio / Module Size	600 DPI Height (inches)	600 DPI Ratio / Module Size
W1G/W1g	0.50	5:2	0.50	7:3	0.50	14:6
W1I	.40	2	.40	4	.40	6
W1J	.40	2	.40	4	.40	6
W1k	N/A	2	N/A	3	N/A	6
W1L	.80	N/A	.80	N/A	.80	N/A
W1M/W1m	N/A	N/A	N/A	N/A	N/A	N/A
W1N/W1n	.40	6:2	.40	9:4	.40	18:6
W1p	N/A	N/A	N/A	N/A	N/A	N/A
W1q	.40	2	.40	4	.40	6
W1R	1.40	2	1.40	4	1.40	6
W1S/W1s	.40	6:2	.40	9:4	.40	18:6
W1t	.40	6:2	.40	9:4	.40	18:6
W1Y/ W1y	.40	2	.40	4	.40	6
W1Z/W1z	N/A	N/A	N/A	N/A	N/A	N/A

A/a Code 3 of 9 Barcode

Label format barcode ID to print a 3 of 9 Barcode with (A) or without (a) Human Readable text.

Syntax

A or a

Parameters

Bar Size

Behavior

Valid Characters: 0-9, A-Z, - . * $ / + % and the space character.

- Variable Length.
- Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

Sample

<STX>L
D11
1A0000000150100012345678 9
121100000000100Barcode A
E

Result

Prints a 3 of 9 barcode with a wide to narrow bar ratio of 3:1.

B/b UPC-A Barcode

Label format barcode ID to print a UPC-A Barcode with (B) or without (b) Human Readable text.

Syntax

B or b

Parameters

Bar Size

Behavior

Valid Characters: 0-9

- Length: 12 digits. If the user provides 11 digits, the printer will compute the checksum.
- If the user provides the checksum, the printer will check that it matches the expected checksum. If it does not match, the printer will print out all zeros and the expected checksum.
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots.
- All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width).

Sample

```
<STX>L
D11
1B0000000150100012345678900
121100000000100Barcode B
E
```

Result

Prints a UPC-A barcode.

C/c UPC-E Barcode

Label format barcode ID to print a UPC-E Barcode with (C) or without (c) Human Readable text.

Syntax

C or c

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: Seven digits. If the user provides six digits, the printer will compute the checksum. If the user provides the checksum, the printer will check that it matches the expected checksum. If it does not match, the printer will print out all zeros and the expected checksum.
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots.
- All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width).

Sample

```
<STX>L
D11
1C00000001501000012345
121100000000100Barcode C
E
```

Result

Prints a UPC-E barcode.

D/d Interleaved 2 of 5 (I 2 of 5) Barcode

Label format barcode ID to print an Interleaved 2 of 5 (I 2 of 5) barcode with (D) or without (d) human readable text.

Syntax

D or d

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Variable Length.
- Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

Sample

<STX>L
D11
1D0000000150100012345678900
121100000000100Barcode D
E

Result

Prints an Interleaved 2 of 5 barcode with a wide to narrow bar ratio of 3:1.

E/e Code 128 Barcode

Label format barcode ID to print a Code 128 barcode with (E) or without (e) human readable text.

Syntax

E or e

Parameters

Bar Size

Behavior

- Valid Characters: The entire 128 ASCII character set.
- Variable Length
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots.
- All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).
- This printer supports the Code 128 subsets A, B, and C. The printer can be selected to start on any code subset and switch to another within the data stream. The default code subset is B; otherwise, the first character (A, B, C) of the data field determines the subset. Subset switching is only performed in response to code switch command. These commands are placed in the data to be encoded at appropriate locations.

Subset A: Includes all of the standard uppercase alphanumeric keyboard characters plus the control and special characters. To select Code 128 Subset A, place an ASCII A (DEC 65, HEX 41) before the data to be encoded.

Subset B: Includes all of the standard uppercase alphanumeric keyboard characters plus the lowercase alphabetic and special characters. To select Code 128 Subset B, place an ASCII B (DEC 66, HEX 42) before the data to be encoded. If no start character is sent for the Code 128 font, Code 128 Subset B will be selected by default.

Subset C: Includes the set of 100 digit pairs from 00 through 99 inclusive, as well as special characters. Code 128 Subset C is used for double density encoding of numeric data. To select Code 128 Subset C, place an ASCII C (DEC 67, HEX 43) before the data to be encoded. Subset C can only encode an even number of numeric characters. When the data to be encoded includes an odd number of numeric characters, the last character causes the printer to automatically generate a "switch to subset B" and encode the last character appropriately in subset B.

Special Character Handling: Characters with an ASCII value greater than 95 are considered special characters. To access these values, a two-character reference table is built into the printer (see below).

For example, to encode FNC2 into a Code 128 Subset A barcode, send the ASCII "&" (DEC 38, HEX 26) followed by the ASCII "B" (DEC 66, HEX 41).

ASCII	2 CHAR	CODE A	CODE B	CODE C
96	&A	FNC3	FNC3	-NA-
97	&B	FNC2	FNC2	-NA-
98	&C	SHIFT	SHIFT	-NA-
99	&D	CODEC	CODEC	-NA-
100	&E	CODEB	FNC4	CODEB
101	&F	FNC4	CODEA	CODEA
102	&G	FNC1	FNC1	FNC1

Control Codes: By sending these control codes, control characters can be encoded into a Code 128 Subset A barcode (e.g., ABC{DE will be encoded as ABC<ESC>DE):

Control Code in the Barcode Data Stream	Encoded Control Character Result
`	NUL
a through z	1 - 26
{	ESC
|	FS
}	GS
~	RS
ASCII 127	US

Sample

<STX>L
D11
1E000000015010001234567890
121100000000100Barcode E
E

Result

Prints a Code 128 barcode.

F/f EAN-13 Barcode

Label format barcode ID to print an EAN-13 barcode with (F) or without (f) human readable text.

Syntax

F or f

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: 13 digits. If the user provides 12 digits, the printer will compute the checksum.
- If the user provides the checksum, the printer will check that it matches the expected checksum. If it does not match, the printer will print all zeros and the expected checksum.
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width).

Sample

```
<STX>L
D11
1F000000015010001234567890 1
121100000000100Barcode F
E
```

Result

Prints an EAN-13 barcode.

G/g EAN-8 Barcode

Label Format Barcode ID to print an EAN-8 barcode with (F) or without (f) human readable text.

Syntax

G or g

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: 8 digits. If the user provides 7 digits, the printer will compute the checksum. If the user provides the checksum, the printer will check that it matches the expected checksum. If it does not match, the printer will print all zeros and the expected checksum.
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots.
- All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width).

Sample

```
<STX>L
D11
1G00000001501000123456
121100000000100Barcode G
E
```

Result

Prints an EAN-8 barcode.

H/h Health Industry Barcode (HIBC)

Label Format Barcode ID to print a Health Industry barcode (HIBC) with (H) or without (h) human readable text.

Syntax

H or h

Parameters

Bar Size

Behavior

- Valid Characters: 0-9, A-Z, -$ /. %
- Variable Length.
- Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.
- The host must supply leading "+"

Sample

<STX>L
D11
1H0000000150050+0123456789
121100000000100Barcode H
E

Result

Prints a HIBC barcode with a wide to narrow bar ratio of 3:1.

I/i Codabar Barcode

Label Format Barcode ID to print a Codabar Barcode with (I) or without (i) Human Readable Text.

Syntax

I or i

Parameters

Bar Size

Behavior

- Valid Characters: 0-9, A-D, -, ., $,:, /, + (comma is not valid)
- Variable Length but requires at least three characters.
- Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.
- Valid Codabar symbols require start and stop characters (A–D). These characters should be placed in the data field along with other data to be included in the symbol.

Sample

<STX>L
D11
1I630400015010000A1234567890D
121100000000100Barcode I
E

Result

Prints a Codabar barcode with a wide to narrow bar ratio of 3:1.

J/j Interleaved 2 of 5 (with a Modulo 10 Checksum) Barcode

Label Format Barcode ID to print an Interleaved 2 of 5 (with a Modulo 10 Checksum) with (J) or without (j) Human Readable text.

Syntax

J or j

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Variable Length.
- Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

Sample

<STX>L
D11
1J000000015010001234567890
121100000000100Barcode J
E

Result

Prints an Interleaved 2 of 5 barcode with a modulo 10 checksum added and with a wide to narrow bar ratio of 3:1.

L/l Interleaved 2 of 5 (with a Modulo 10 Checksum and Bearer Bars) Barcode

Label Format Barcode ID to print an Interleaved 2 of 5 Barcode (with a Modulo 10 Checksum and Bearer Bars) and with (L) or without (l) Human Readable text.

Syntax

L or l

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Variable Length: For the bearer bars to be printed, 13 characters are required.
- Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

Sample

```
<STX>L
D11
1L0000000150100012345678901 2
121100000000100Barcode L
E
```

Result

Prints an Interleaved 2 of 5 barcode with a modulo 10 checksum with a wide to narrow bar ratio of 3:1 and bearer bars.

M/m 2-Digit UPC Addendum Barcode

Label Format Barcode ID to print a 2-Digit UPC Addendum Barcode with (M) or without (m) Human Readable text.

Syntax

M or m

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: 2 digits.
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width). Human readable characters for this barcode symbology are printed above the symbol.

Sample

<STX>L
D11
1M0000000015010042
121100000000100Barcode M
E

Result

Prints a 2 digit UPC barcode addendum.

N/n 5-Digit UPC Addendum Barcode

Label Format Barcode ID to print a 5-Digit UPC Addendum Barcode with (N) or without (n) Human Readable text.

Syntax

N or n

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: 5 digits.
- Valid bar widths: The width multiplier is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width). Human readable characters for this barcode symbology are printed above the symbol.

Sample

<STX>L
D11
1N0000000150100012 34
121100000000100Barcode N
E

Result

Prints a 5 digit UPC barcode addendum.

O/o Code 93 Barcode

Label Format Barcode ID to print a Code 93 Barcode with (O) or without (o) Human Readable text.

Syntax

O or o

Parameters

Bar Size

Behavior

- Valid Characters: 0-9, A-Z, -.$/+% and the space character.
- Variable Length.
- Valid bar widths: The width multiplier is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width).

Sample

<STX>L
D11
1O00000000150100Datamax42
121100000000100Barcode O
E

Result

Prints a Code 93 barcode.

p Postnet Barcode

Label Format Barcode ID to print a Postnet barcode.

Syntax

p

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: 5, 9 or 11 digits
- Valid bar widths: The width and height multiplier values of 00 will produce a valid Postnet symbol.
- Usage: The barcode height field is ignored since the symbol height is United States Postal Service specific. This barcode is to display the zip code on a letter or package for the US Postal Service.

Sample

<STX>L
D11
1p000000015010032569
121100000000100Barcode p
E

Result

Prints a Postnet barcode.

Q/q UCC/EAN Code 128 Barcode

Label Format Barcode ID to print a UCC/EAN Code 128 Barcode with (Q) or without (q) Human Readable.

Syntax

Q or q

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: 19 digits.
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width). Human readable characters for this barcode symbology are printed above the symbol.
- The printer spreads a weighted module 103 check sum.

Sample

```
<STX>L
D11
1Q0000000150100012345678901234567 8
121100000000100Barcode Q
E
```

Result

Prints a UCC/EAN Code 128 barcode.

R/r UCC/EAN Code128 K-MART NON EDI Barcode

Label Format Barcode ID to print an UCC/EAN Code128 K-MART NON EDI Barcode with (R) or without (r) Human Readable text.

Syntax

R o r

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: 18 digits
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width). Human readable characters for this barcode symbology are printed above the symbol. (See W1R for an alternate.)
- This barcode is set up according to K-MART specifications.

Sample

```
<STX>L
D11
1R00000001501000123456789012345 67
121100000000100Barcode R
E
```

Result

Prints a KMART barcode.

S/s UCC/EAN Code 128 Random Weight Barcode

Label Format Barcode ID to print an UCC/EAN Code 128 Random Weight Barcode with (S) or without (s) Human Readable text.

Syntax

S or s

Parameters

Bar Size

Behavior

- Valid Characters: 0-9
- Length: At least 34 digits.
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times, 3 times, and 4 times the narrow bar width).
- This barcode is commonly used by the food and grocery industry.

Sample

<STX>L
D11
1S0000000150050011007367502926011930420320200180021101234561211000000000100Barcode S
E

Result

Prints a UCC/EAN Code 128 Random Weight barcode.

u UPS MaxiCode, Modes 2 & 3 Barcode

Label Format Barcode ID(u) to print a UPS MaxiCode, Modes 2 & 3.

Syntax

u

Behavior

The printer supports MaxiCode as defined in the AIM Technical Specification. The following examples illustrate various label format record message syntaxes for encoding data as MaxiCode. In the following examples, special formatting is used to denote special ASCII characters as shown:

Symbol	Hexidecimal Value
RS	1E
GS	1D
EOT	04

- Printer message syntax allows for EOT to be substituted with <CR> or the use of both EOT and <CR>.
- The data stream can force Mode 2 or 3 encoding by placing #2 or #3, respectively, before the data. If this is not specified, the printer chooses the best mode.

Sample

```
<STX>L
D11
1u0000001200120#3
[)>RS01GS96123456GS068GS001GS1Z12345675GSUPSNGS12345EGS089GSGS1/
1GS10.1GSYGSGSGSUTRSEOT
121100000000100Barcode u
E
```

Result

Prints a MaxiCode symbol in Mode 3.

Where:

- #3 (Forces Mode 3 encoding)
- [)>RS01GS96 (Message Header)
- 123456 Maximum 9 alphanumeric ASCII, postal code (Primary Message)
- 068 Country Code (Primary Message)
- 001 Class (Primary Message)

- GS1Z1... (Secondary Message)
- ...TRSEOT

U UPS MaxiCode, Modes 2 & 3 Barcode with Byte Count Specifier

Label Format Barcode ID (U) to print a UPS Maxicode, Modes 2 & 3. This ID allows users to specify the number of data byte to be in the barcode. This allows for special control codes like cr's to be included in the data.

Syntax

U

Parameters

Byte Count

Behavior

Specified Length – The upper case U identifies a UPS MaxiCode barcode with a 4-digit string length specifier. This allows values 0x00 through 0xFF to be included within the data strings without conflicting with the DPL format record terminators. The four-digit decimal data byte count immediately follows the 4-digit column position field. This value includes all of the data following the byte count field, but does not include itself.

Sample

<STX>L
D11
1U00000010001000051327895555840666this package<0x0D>is going to Datamax
121100000000100Barcode U
E

Result

Prints a Maxicode barcode that includes a Byte Count Specifier (the portion in bold), where 0051 equals the four-digit decimal data byte count and includes all bytes that follow until the end of the barcode data. Field termination is set by the byte count. <STX>, <CR>, and <0x0D> all represent single byte values of hexadecimal 02, 0D, and 0D, respectively. The UPS MaxiCode barcode produced encodes "327895555840666this package<CR>is going to Datamax", and prints a line of text: Barcode U.

Z PDF-417 Barcode with Byte Count Specifier

Label Format Barcode ID (Z) to print a PDF-417 barcode. This ID allows users to specify the number of data byte to be in the barcode. This allows for data.values 0x00 through 0xFF to be included within the data strings without conflicting with the DPL format record terminators.

Syntax

Z

Parameters

- Byte Count
- See Behavior section for details.

Behavior

Specified Length – The upper case Z identifies a PDF-417 barcode with a string 4-digit length specifier. This allows values 0x00 through 0xFF to be used within the data strings without conflicting with the DPL format record terminators. The four-digit decimal data byte count immediately follows the 4-digit column position field. This value includes all of the data following the byte count field, but does not include itself.

Sample

<STX>L
D11
1Z000000015010000**15**F1000000pdf<0x0D>417
121100000000100Barcode Z
E

Result

From the example above, the barcode's data stream,
1Z000000015010000**15**F1000000pdf<CR>417

includes a Byte Count Specifier (the portion in bold), where 0015 equals the four-digit decimal data byte count and includes all bytes that follow until the end of the barcode data. Field termination is set by the byte count. <STX>, <CR>, and <0x0D> all represent single byte values of hexadecimal 02, 0D, and 0D, respectively. The PDF-417 barcode produced encodes "pdf<CR>417", and prints a line of text: Barcode Z.

z PDF-417 Barcode

Label Format Barcode ID (z) to print a PDF-417 barcode.

Syntax

z

Parameters

See Behavior section for details.

Behavior

- Valid Characters: All ASCII characters.
- Variable Length – This two dimensional barcode holds large amounts of data in a small area, while providing a high level of redundancy and error checking, if specified.

Sample

<STX>L
D11
1z00000000150100F1000000PDF417
121100000000100Barcode z
E

Result

Prints a normal, security level one, PDF-417 barcode with a 1:2 aspect ratio and best-fit rows and columns. The (bolded) barcode's data stream 1z00000000150100F1000000PDF417 decodes as follows:

Example Data	Explanation
F	1-character specifying a normal or truncated barcode (T to truncate, F for normal).
1	1-digit security level ranging from 0 to 8.
00	2-digit aspect ratio specified as a fraction, with the first digit being the numerator and the second digit the denominator. Use "00" for the default ratio of 1:2. Valid range is from "00" to "99."
00	2-digit number specifying the number of rows requested. Use "00" to let the printer find the best fit. Valid range is from "03" to "90". Row values less than 3 are set to 3, while row values greater than 90 are set to 90.

Example Data	Explanation
00	2-digit number specifying the number of columns requested. Use "00" to let the printer find the best fit. Valid range is from "01" to "30". Column values greater than 30 are set to 30.
PDF417	The data stream to be encoded.
<CR>	Terminates the data stream.

W1c DataMatrix Barcode

Label Format Barcode ID (W1c) to print a DataMatrix barcode.

Syntax

W1c

Parameters

See Behavior section for details

Behavior

- Valid Characters: Any 8-bit byte data
- Variable Length
- DataMatrix is a two-dimensional matrix symbology, which is comprised of square modules arranged within a perimeter finder pattern. There are two basic types: ECC 000-140 and ECC 200.

ECC 000 – 140 symbols

These square symbols can be any odd size from 9x9 to 49x49, which may be specified in fields jjj and kkk. If an ECC 000-140 symbol is specified with even numbers of rows or columns, the next largest odd value will be used. Input values greater than 49 or less than 9 will cause the symbol to be automatically sized for the input character stream. The record format is shown here, expanded with spaces.

a W b[b] c d eee ffff gggg hhh i jjj kkk ll...l

Where:

Field	Valid Inputs	Meaning
a	1,2,3, and 4	Rotation
W	W	Fixed value, extended barcode set
b[b]	c, 1c	Selects the DataMatrix barcode - the two differing values have no other significance.
c	1 to 9, A to Z, and a to z	Module size horizontal multiplier
d	1 to 9, A to Z, and a to z	Module size vertical multiplier

Field	Valid Inputs	Meaning
eee	000 to 999	No effect; Must be numeric
ffff	0000 to 9999	Label position, row
gggg	0000 to 9999	Label position, column
hhh	000, 050, 080, 100, 140	A 3-digit convolutional error correction level. If any number other than one of these options is entered then the nearest lesser value from the valid entries is used.

Field	Valid Inputs	Meaning
i	0 - 6	1 digit format identification: 0 - Automatically choose the encodation scheme based on the characters to be encoded. 1 - Numeric data. 2 - Upper-case alphabetic. 3 - Upper-case alphanumeric and punctuation characters (period, comma, hyphen, and slash). 4 - Upper-case alphanumeric. 5 - ASCII, the full 128 ASCII character set. 6 - Any 8-bit byte. If a format identifier is selected which will not encode the input character stream then the barcode symbol will not be printed. Auto-encodation format identification is recommended since it will select the best possible encodation scheme for the input stream.
jjj	9, 11, 13 ... 49. ECC 140 minimum is 15.	A 3 digit odd number (or 000) of rows requested. 000causes rows to be automatically determined. If the rows and columns do not match, the symbol will be sized to a square using the greater of the two values.

Field	Valid Inputs	Meaning
kkk	9, 11, 13 ... 49. ECC 140 minimum is 15.	A 3 digit odd number (or 000) of columns requested. 000 causes columns to be automatically determined. If the rows and columns do not match, the symbol will be sized to a square using the greater of the two values.
ll...l	8-bit data, followed by a termination character.	Data to be encoded.

ECC 200 symbols

There are 24 square symbol sizes available, with both row and column dimensions, which may be specified in fields jjj and kkk, measured in modules as indicated in the following list - 10, 12, 14, 16, 18, 20, 22, 24, 26, 32, 36, 40, 44, 48, 52, 64, 72, 80, 88, 96, 104, 120, 132, and 144. If an ECC 200 symbol is specified with odd numbers of rows or columns, the next largest even value will be used. Input values greater than 144 or less than 10 will cause the symbol to be automatically sized for the input character stream. The record format is shown here, expanded with spaces.

a W b[b] c d eee ffff gggg hhh i jjj kkk ll...l

Where:

Field	Valid Inputs	Meaning
a	1,2,3, and 4	Rotation
W	W	Fixed value, extended barcode set
b[b]	c, 1c	Selects the DataMatrix barcode - the two differing values have no other significance.
c	1 to 9, A to Z, and a to z	Module size horizontal multiplier
d	1 to 9, A to Z, and a to z	Module size vertical multiplier
eee	000 to 999	No effect; Must be numeric
ffff	0000 to 9999	Label position, row

Field	Valid Inputs	Meaning
gggg	0000 to 9999	Label position, column
hhh	200	ECC 200 uses Reed-Solomon error correction.
i	0	Fixed value, not used
jjj	10, 12, 14, 16, 18, 20, 22, 24, 26, 32, 36, 40, 44, 48, 52, 64, 72, 80, 88, 96, 104, 120, 132, 144	A 3 digit even number (or 000) of rows requested. 000 causes rows to be automatically determined. The symbol will be sized to a square if the rows and columns do not match by taking the larger of the two values.
kkk	10, 12, 14, 16, 18, 20, 22, 24, 26, 32, 36, 40, 44, 48, 52, 64, 72, 80, 88, 96, 104, 120, 132, 144	A 3 digit even number (or 000) of columns requested. 000 causes columns to be automatically determined. The symbol will be sized to a square if the rows and columns do not match by taking the larger of the two values.
ll...l	8-bit data, followed by a termination character.	Data to be encoded.

Sample

<STX>L
D11
1W1c4400001000100200000000DATAMAX
121100000000100Barcode W1c
E

W1C DataMatrix Barcode with Byte Count Specifier

Label Format Barcode ID (W1C) to print a DataMatrix barcode. This ID allows users to specify the number of data byte to be in the barcode. This allows for data values 0x00 through 0xFF to be included within the data strings without conflicting with the DPL format record terminators.

Syntax

W1C

Parameters

- Byte Count
- See Behavior section for details

Behavior

Specified Length – The upper case C identifies a DataMatrix barcode with a string 4-digit length specifier. This allows values 0x00 through 0xFF to be included within the data strings without conflicting with the DPL format record terminators. The four-digit decimal data byte count immediately follows the four-digit column position field. This value includes all of the data following the byte count field, but does not include itself.

Sample

<STX>L
D11
1W1C44000010001000029**2000000000**Datamax<0x0D>prints best
121100000000100Barcode W1C
E

Result

From the example above, the barcode's data stream, 1W1C44000010001000029**2000000000** Datamax<0x0D>prints best includes a Byte Count Specifier (the portion in bold), where 0029 equals the four-digit decimal data byte count and includes all bytes that follow until the end of the barcode data. Field termination is set by the byte count. <STX>, <CR>, and <0x0D> all represent single byte values of hexadecimal 02, 0D, and 0D, respectively. The DataMatrix barcode produced encodes "Datamax<CR>prints best," and prints a line of text: Barcode W1C.

W1d / W1D QR Code Barcode

Label Format Barcode ID's for printing a QR Code barcode in Auto Format (d) or Manual Format (D) modes.

Syntax

a W1 b c d eee ffff gggg hh...h

Parameters

Where:

Field	Valid Inputs	Meaning
a	1, 2, 3, and 4	Rotation
W1	W1	Fixed value, extended barcode set
b	D and d	Selects the QR barcode formatting mode, where: D = Manual formatting. Allows the data string (hh...h) to be entered with a comma (,) as a field separator; fields are optional per QR Code specifications, and the first field indicates Model 1 or Model 2 QR Code (Model 2 is the default). d = Automatic formatting. Allows the data string (hh...h) to be data only.
c	1 to 9, A to Z, and a to z	Module size horizontal multiplier Each cell in the barcode is square, therefore "c" and "d" must be equal. Depending on the conversion mode (<STX>n or <STX>m), each unit indicates a cell dimension of .01 inch or .1 mm.

Field	Valid Inputs	Meaning
d	1 to 9, A to Z, and a to z	Module size vertical multiplier
eee	000 to 999	No effect; Must be numeric
ffff	0000 to 9999	Label position, row
gggg	0000 to 9999	Label position, column
hhh	Valid ASCII character string, followed by (a) termination character(s)	QR Code data string (see Generation Structure, below).

Behavior

- Valid Characters: Numeric Data, Alphanumeric Data, 8-bit byte data, and Kanji characters
- Variable Length: The two-dimensional barcode (as documented in AIM, Version 7.0).

Generation Structure

The data input structure (hh...h) is as follows:

Auto Format (W1d)

With barcode identifier "d", the data begins after the last character of the column position field, and does not include any command characters. The data string is terminated with a termination character, usually a 0x0d hex that occurs twice in succession. The barcode symbol will have the following characteristics:

1. Model 2
2. Error Correction Code Level = "M" (Standard Reliability Level)
3. Mask Selection = Automatic
4. Data Input Mode = Automatic[1]

Manual Formatting (W1D)

With barcode identifier "D", minor changes allow flexibility for data entry. (Spaces have been added for readability.)

[q,] [e [m] i,] cdata cdata cdata...cdata term[2]

Where:

Field	Valid Inputs	Meaning
q	1, 2	QR Code Model number, optional. Model 2 is the default.
e	H, Q, M, L	Error Correction Level (Reed-Solomon) – Four levels allowing recovery of the symbol code words: H = Ultra Reliability Level (30%) Q = High Reliability Level (25%) M = Standard Reliability Level (15%) L = High Density Level (7%)
m	0 – 8, none	Mask Number, optional: None = Automatic Selection 0-7 = Mask 0 to Mask 7 8 = No Mask
I	A, a, M, m	Data Input Mode: A = Automatic setting, ASCII [1] a = Automatic, hex-ASCII [1] M = Manual Setting, ASCII [2] m = manual, hex-ASCII[2]

Field	Valid Inputs	Meaning
cdata	N, A, B, K immediately followed by data	Character Mode: N = Numeric, N data A = Alphanumeric, A data B = Binary, Bnnnn data (where nnnn = data byte count, 4 decimal digits; byte-count /2 for hex- ASCII K = Kanji, K data
term	[3]	The data string is terminated with a termination character, generally a 0x0d hex, but can be changed by the operator. If the Data Input Mode is Automatic, the data string is terminated with two successive termination characters.

[1] When Data Input Mode = Automatic, Kanji data cannot be used; Manual data input required.

[2] When using manual formatting, commas are required between format fields and data types.

[3] <CR> represents the line termination character as defined by the current control code set or after use of Txx, line field terminator label format command.

If HEX/ASCII mode is selected in manual Data Input Mode, only the data for Kanji or Binary data types will be converted, therefore the other data types and all command characters must be entered in ASCII format. If HEX/ASCII is selected in automatic Data Input Mode, all of the data must be entered in HEX/ASCII format.

Data Append Mode String Format, Manual Formatting – Barcode W1D

D aa tt pp l

Where:

Field	Valid Inputs	Meaning
D	D	Data Append Mode String Format indicator
aa	00, 99	QR Code Number in Append Series, 2 decimal digits
tt		The total number of QR Codes in series, 2 decimal digits
pp		Value of Parity, 2 digits, 8 LSBs of data parity
e	H, Q, M, L	As above
m	0 – 8, none	As above
i	A, a, M, m	As above
cdata	N, A, B, K immediately followed by data	As above
term		As above

Characteristics

Models:

- Model 1 (original version), barcode versions 1 through 14
    - A. ECC Levels "H", "M", "Q", and "L"
    - B. Mask Selection Automatic or 0 through 8
    - C. Data Input Modes Automatic and Manual
    - D. Data Append Mode
- Model 2 (enhanced version), barcode versions 1 through 40
    - A. ECC Levels "H", "M", "Q", and "L"
    - B. Mask Selection Automatic or 0 through 8
    - C. Data Input Modes Automatic and Manual
    - D. Data Append Mode

Representation of data:

- Dark Cell = Binary 1
- Light Cell = Binary 0

Symbol Size (not including quiet zone, 4 cells on each of the 4 sides):

- Model 1: 21 X 21 cells to 73 X 73 cells (Versions 1 to 14, increase in steps of 4 cells per side)
- Model 2: 21 X 21 cells to 177 X 177 cells (Versions 1 to 40, increase in steps of 4cells per side)

Data Characters per symbol (maximum for symbol size):

- Numeric Data
    - Model 1; Version 14; ECC = L: 1,167 characters
    - Model 2; Version 40; ECC = L: 7,089 characters
- Alphanumeric Data
    - Model 1; Version 14; ECC = L: 707 characters
    - Model 2; Version 40; ECC = L: 4,296 characters
- Binary Data
    - Model 1; Version 14; ECC = L: 486 characters
    - Model 2; Version 40; ECC = L: 2,953 characters
- Kanji Data
    - Model 1; Version 14; ECC = L: 299 characters
    - Model 2; Version 40; ECC = L: 1,817 characters
- Code Type: Matrix
- Orientation Independence: Yes

Sample

```
<STX>L
D11
1W1D44000001000102HM,AThis is the data portion also with
binary,B0003<0xfe><0xca><0x83><0x0D>
121100000000100Barcode W1D
E
```

Result

Where:

- QR Code barcode, Cell Size = 0.1 inch square, positioned at X =. 1" and Y = .1", ECC=H, Mask = Automatic, Data Input Mode = Manual.
- <STX>L
- D11
- 1W1D44000001000l0H3M,AThis is the data portion also with
- binary,B0003<0xfe><0xca><0x83><0x0D>

- 121100000000100Barcode W1D
- E

Where:

- QR Code barcode, Cell Size = 0.04 inch square, positioned at X = .1" and Y = .1", ECC = H, Mask = 3, Data Input Mode = Manual.
- <STX>L
- D11
- 1W1D880000010000102,LM,K<0x81><0x40><0x81><0x41><0x81><0x42><0x0D>
- 121100000000100Barcode W1D
- E

Where:

- QR Code barcode, Cell Size = 0.08 inch square, positioned at X = .1" and Y = .1", ECC = L, Mask = Automatic, Data Input Mode = Manual - Kanji.

W1f / W1F Aztec Barcode

Label Format Barcode ID's for printing an Aztec barcode in variable and fixed length modes.

Variable Length (W1f): This two dimensional barcode holds a large amount of data in a small area and can provide a high level of error checking.

Specified Length (W1F): With a string four-digit length specifier, values 0x00 through 0xFF to be included within the data strings without conflicting with the DPL format record terminators.

Syntax

a W1 b c d eee ffff gggg [hhhh] i jjj kk...k

Parameters

Where:

Field	Valid Inputs	Meaning
a	1, 2, 3, and 4	Rotation
W1	W1	Fixed value, extended barcode set
b	f and F	Lowercase selects the Aztec barcode, variable length. Uppercase selects the Aztec barcode with a Byte Count Specifier
c	1 to 9, A to Z, and a to z	Module size horizontal multiplier, 0 = default size. The c/d module size parameters should be equal to produce a square symbol. When the label command (Dwh) is used to generate larger text, then c and d may be used to compensate and ensure a square symbol.
d	1 to 9, A to Z, and a to z	Module size vertical multiplier, 0 = default size (See explanation for "c", above.)

Field	Valid Inputs	Meaning
eee	000	No Effect
ffff	0000 to 9999	Label position, row
gggg	0000 to 9999	Label position, column
[hhhh]	0000 to 9999	Optional string length specifier. Field termination is set by this byte count. This decimal value includes all of the data following this byte count field, but does not include itself.
i	0, 1	Extended Channel Interpretation (ECI) mode; 0 = Disabled, 1 = Enabled
jjj	000 to 300	Error Correction (EC) / Amount (see table below), where: 000 – Default EC, approximately 23% 001 – 099 EC fixed value, expressed as a percent. 101 – 104 Compact core, 1 to 4 layers respectively. 201 – 232 Full size core, 1 to 32 layers respectively. 300 – Rune format, encodes three ASCII decimal digits 0-256; scanner decode output is decimal number 0-256
kk...k	8-bit data, followed by a termination character	Data to be encoded.

The error correction or size selection determines the symbol size and other characteristics of the symbol, as shown in the following table. Attempting to encode more data that has been made available will result in no symbol printed.

Error Correction (EC) / Size Implications

jjj	Symbol Size [1]	Symbol Format	Maximum [2] Binary Data Bytes	Maximum [2] Alphabetic Characters	Maximum [2] Numeric Characters
000	variable	data dependent	1914	3067	3832
001 to 099	variable	data and EC dependent	1914	3067	3832
101	15	compact	6	12	13
102	19	compact	19	33	40
103	23	compact	33	57	70
104	27	compact	53	89	110
201	19	full size	8	15	18
202	23	full size	24	40	49
203	27	full size	40	68	84
204	31	full size	62	104	128
205	37	full size	87	144	178
206	41	full size	114	187	232
207	45	full size	145	236	294
208	49	full size	179	291	362
209	53	full size	214	348	433
210	57	full size	256	414	516
211	61	full size	298	482	601
212	67	full size	343	554	691
213	71	full size	394	636	793
214	75	full size	446	718	896
215	79	full size	502	808	1008
216	83	full size	559	900	1123
217	87	full size	621	998	1246
218	91	full size	687	1104	1378
219	95	full size	753	1210	1511
220	101	full size	824	1324	1653
221	105	full size	898	1442	1801

jjj	Symbol Size [1]	Symbol Format	Maximum [2] Binary Data Bytes	Maximum [2] Alphabetic Characters	Maximum [2] Numeric Characters
222	109	full size	976	1566	1956
223	113	full size	1056	1694	2116
224	117	full size	1138	1826	2281
225	121	full size	1224	1963	2452
226	125	full size	1314	2107	2632
227	131	full size	1407	2256	2818
228	135	full size	1501	2407	3007
229	139	full size	1600	2565	3205
230	143	full size	1702	2728	3409
231	147	full size	1806	2894	3616
232	151	full size	1914	3067	3832
300	11	Rune	1	1	1

[1] Measured in module size x, assuming default module size (cd=00).

[2] Maximum sizes are approximate and data dependent, and may be less than indicated.

Error Correction

Size 001 to 099: This value specifies the percent of symbol code words to be used for error correction. Actual error correction word percentage will vary depending on data. The default value, approximately 23%, is recommended. Any other value may be selected to meet the user's needs. Some minimum-security code word may be generated depending on the data sent for encoding, particularly when the volume of that data is small. It the data capacity is exceeded no symbol is printed.

Size 101 to 104: Values 101 through 104 results in 1 through 4 layers (two modules thick) respectively, around the center finder pattern. Data volume constraints apply as indicated in the table above. Symbols will be of the compact form. All available code word will be used for error correction. It the data capacity is exceeded no symbol is printed.

Size 201 to 232: Values 201 through 232 result in 1 through 32 layers (two modules thick) respectively, around the center finder pattern. Data volume constraints apply as indicated in the table above. Symbols will be of the full-size form. All available code words will be used for error correction. It the data capacity is exceeded no symbol is printed.

Size 300: Value 300 informs the printer that the data, which follows will be used to encode one RUNE symbol. The data consists of one to three ASCII digits with value range of 0 to 256. The data may include leading zeros. Data streams longer than three digits or data that includes non-numeric characters may have unpredictable results.

Extended Channel Interpretation Mode

A value of 1 provides for extended channel code words to be inserted into the barcode symbol, using escape sequences in the data stream. This mode also provides for effective Code 128 and UCC/EAN 128 emulations, when used in with appropriately configured barcode readers. The valid values for escape sequences are of the form <ESC>n, where:

<ESC> – 1 byte with value 2710 = 1B16

n – 1 ASCII digit, range 0 through 6

These escape sequences are encoded as FLG(n) character pairs described in the International Symbology Specification – Aztec Code, AIM, 1997-11-05, and the meanings of the values for n are the same in both.

<ESC>0 – Is encoded as FLG(0), and interpreted as FNC1 or <GS> depending on its location in the data stream. The printer does not validate <ESC>0 locations in the data stream. When <ESC>0 is the leading data in the stream, it is interpreted as a FNC1 as used in the Code 128 symbology, and specifically for UCC/EAN 128 applications. For appropriately configured scanners this will be interpreted/transmitted as a]C1 symbology identifier preamble. The printer does not validate UCC/EAN 128 data syntax. When <ESC>0 follows a single alphabetic or two numeric characters respectively, then it also interpreted as a FNC1. For appropriately configured scanners this would be interpreted/transmitted as a]C2 symbology identifier preamble, and the alpha or numeric characters preceding the FNC1 are Application Indicators assigned by AIM International. The printer does not check AI validity. When <ESC>0 is anywhere else in the data stream, a <GS> replaces it in the barcode symbol, as with UCC/EAN 128 field separators.

<ESC>n – Is encoded as FLG(n), and is interpreted as signaling Extended Channel Interpretation. When the value of n is from 1 to 6, it signals that the following n digits comprise an extended channel identifier for use with ECI compliant barcode scanners. An erroneous barcode symbol may result from failing to follow <ESC>n with n digits. Any <ESC>0 following <ESC>n and not within the n digits will be encoded as FLG(0). In the context of a FLG(n), any backslash "\" (9210) will be interpreted by the scanner as two backslashes "\\".

Functions Not Supported

- Structured Append
- Reader Initialization Symbol Generation

- Module shaving

Behavior

Valid Characters: All ASCII characters, depending upon the selected options.

Variable Length (W1f): This two dimensional barcode holds a large amount of data in a small area and can provide a high level of error checking.

Specified Length (W1F): With a string four-digit length specifier, values 0x00 through 0xFF to be included within the data strings without conflicting with the DPL format record terminators.

Sample

<STX>L
D11
1W1f00000001501000000AZTEC
121100000000100Barcode W1f
E

Result

The variable length example encodes "AZTEC" with no ECI input, and 23% error correction, and prints the barcode. A line of text is also printed.

Sample

<STX>L
D11
1W1F00000001501000017000OAZTEC<0x0D>barcode
121100000000100Barcode W1F
E

Result

The specified length example includes a byte count field for all bytes that follow until the end of the barcode data. The byte count is 17. The symbology encodes "AZTEC<CR>barcode", and prints the barcode. Notice that a <CR> does not terminate the barcode format record. A line of text is also printed.

W1I EAN128 Barcode (with Auto Subset Switching)

Label Format Barcode ID (W1I) to print EAN128 (with Auto Subset Switching and Human Readable text).

Syntax

W1I

Parameters

See Behavior Section below for details.

Behavior

Valid characters: The entire 128 ASCII character set.

Variable length, minimum 4 characters.

Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

This printer supports the Code 128 subsets A, B, and C. If the data begins with at least four numeric characters, the default start code is subset C. If there is a non-numeric in the first four characters, then the default start code is subset B. The next character after start is always FNC1. Subset switching between B and C is performed based on rules as below:

1. If in subset C and there are an odd number of numeric digits, subset B will be set prior to the last digit.
2. If four or more numeric digits appear consecutively while in subset B, the character code C will be set prior to the digits.
3. When in subset C and a non-numeric occurs, subset B will be inserted prior to the character.

Note that there is no auto-switching from or to Subset A. Standard switches are still used (see table below).

Subset A: Includes all of the standard uppercase alphanumeric keyboard characters plus the control and special characters.

Subset B: Includes all of the standard uppercase alphanumeric keyboard characters plus the lowercase alphabetic and special characters.

Subset C: Includes the set of 100 digit pairs from 00 through 99 inclusive, as well as special characters. EAN128 Subset C is used for double density encoding of numeric data.

Special Character Handling: Characters with an ASCII value greater than 95 are considered special characters. To access these values, a two-character reference table is built into the printer; see table below.

ASCII	2 CHAR	CODE A	CODE B	CODE C
96	&A	FNC3	FNC3	-NA-
97	&B	FNC2	FNC2	-NA-
98	&C	SHIFT	SHIFT	-NA-
99	&D	CODEC	CODEC	-NA-
100	&E	CODEB	FNC4	CODEB
101	&F	FNC4	CODEA	CODEA
102	&G	FNC1	FNC1	FNC1

Control Codes: By sending these control codes, control characters can be encoded into a Code 128 Subset A barcode (e.g., ABC{DE will be encoded as ABC<ESC>DE):

Control Code in the Barcode Data Stream	Encoded Control Character Result
`	NUL
a through z	1 - 26
{	ESC
|	FS
}	GS
~	RS
ASCII 127	US

Sample

<STX>L
D11
1W1I0000000250025123456&G10Z2133021AK
121100000000100Barcode W1I
E

Result

Prints anEAN128 barcode. When scanned this barcode will decode as follows:

[C][FNC1]1234[B]5[F1]10Z[C]213302[B]1AK(81)

W1J Code 128 Barcode (with Auto Subset Switching)

Label Format Barcode ID (W1J) to print a Code 128 (with Auto Subset Switching).

Syntax

W1J

Parameters

See behavior section below for details.

Behavior

- Valid characters: The entire 128 ASCII character set.
- Variable length.
- Valid bar widths: The fourth character of record is the width of the narrow bar in dots.
- All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).
- This printer supports the Code 128 subsets A, B, and C. If the data begins with at least four numeric characters, the default start code is subset C. If there is a non-numeric in the first four characters or there are less than four, then the default start code is subset B. Subset switching between B and C is based on the following rules:
- If in subset C and there are an odd number of numeric digits, subset B will be set prior to the last digit.
- If four or more numeric digits appear consecutively while in subset B, the character code C will be set prior to the digits. If there is an odd number of numerics already in B, the first numeric will be placed in B with the others in C.
- When in subset C and a non-numeric occurs, subset B will be inserted prior to the character.
- Note that there is no auto switching from, or to, subset A. Standard switches are still used. See table below.

Subset A: Includes all of the standard uppercase alphanumeric keyboard characters plus the control and special characters.

Subset B: Includes all of the standard uppercase alphanumeric keyboard characters plus the lowercase alphabetic and special characters.

Subset C: Includes the set of 100 digit pairs from 00 through 99 inclusive, as well as special characters. Code128 Subset C is used for double density encoding of numeric data.

Special Character Handling: Characters with an ASCII value greater than 95 are considered special characters. To access these values, a two-character reference table is built into the printer; see table below.

ASCII	2 CHAR	CODE A	CODE B	CODE C
96	&A	FNC3	FNC3	-NA-
97	&B	FNC2	FNC2	-NA-
98	&C	SHIFT	SHIFT	-NA-
99	&D	CODEC	CODEC	-NA-
100	&E	CODEB	FNC4	CODEB
101	&F	FNC4	CODEA	CODEA
102	&G	FNC1	FNC1	FNC1

Control Codes: By sending these control codes, control characters can be encoded into a Code 128 Subset A barcode (e.g., ABC{DE will be encoded as ABC<ESC>DE):

Control Code in the Barcode Data Stream	Encoded Control Character Result
`	NUL
a through z	1 - 26
{	ESC
|	FS
}	GS
~	RS
ASCII 127	US

Sample

<STX>L
D11
1W1J000000025002512345&G10Z2133021AK
121100000000100Barcode W1J
E

Result

Prints a Code128 Auto barcode. When scanned this barcode will decode as follows:

[C]1234[B]5[F1]10Z2 [C]133021[B]AK(95)

W1k GS1 DataBar Barcode

Label Format Barcode ID (W1k) to print GS1 DataBar barcode. Supports six types: GS1 DataBar, DataBar Truncated, DataBar Stacked, DataBar Stacked Omni-Directional, DataBar Limited, and DataBar Expanded.

Syntax

W1k

Parameters

See behavior section below.

Behavior

Valid Characters: Type dependent

Barcode Data String Length: Type dependent

GS1 DataBar is a continuous, linear symbology used for identification in EAN.UCC systems. There are six different types:

GS1 DataBar Type	Overview*
GS1 DataBar	• Encodes a full 14-digit EAN.UCC item identification within a linear symbol that can be scanned omni-directionally. • The encodable character set is 0 through 9. • The maximum numeric data capacity is the application identifier plus 14-digit numeric item identification. • Error detection is mod 79 checksum.
GS1 DataBar Truncated	
GS1 DataBar Stacked	
GS1 DataBar Stacked Omni-Directional	

GS1 DataBar Type	Overview*
GS1 DataBar Limited	• Encodes a 14-digit EAN.UCC item identification with indicator digits of zero or one within a linear symbol. • The encodable character set is 0 through 9. • The maximum numeric data capacity for is the application identifier plus 14-digit numeric item identification. • Data must begin with indicator 0 or 1. Any higher number results in discarded data. • Error detection is mod 89 checksum.
GS1 DataBar Expanded	• Encodes EAN.UCC item identification plus supplementary AI element strings. • The encodable character is a subset of ISO 646, consisting of upper and lower case letters, digits and 20 selected punctuation characters, plus the special function character FNC1, (#). • The maximum numeric data capacity is 74 numeric or 41 alphanumeric. • Error detection is mod 211 checksum.

*Additional data can be encoded in a two-dimensional composite as per specification (see AIM Spec ITS/99-001 for more details).

Syntax for GS1 DataBar (spaces added for readability):

a W1 k c d eee ffff gggg h i j m n...n | p...p

Field	Valid Inputs	Meaning
a	1, 2, 3, and 4	Rotation
W1	W1	Fixed value, extended barcode set
k	k	Selects GS1 barcode
c	1 to 9, A to Z, and a to z	Wide bar ratio, default = 2
d	1 to 9, A to Z, and a to z	Narrow bar ratio, default = 2
eee	000	No Effect

Field	Valid Inputs	Meaning
ffff	0000 to 9999	Label position, row
gggg	0000 to 9999	Label position, column
h	R, T, S, D, L	GS1 Type: R = GS1 DataBar Linear, T = GS1 DataBar Truncated, S = GS1 DataBar Stacked, D = GS1 DataBar Stacked Omni-Directional, L = GS1 DataBar Limited
i	1-9	Pixel Multiplier
j	0 to (i-1)	X pixels to undercut
m	0 to (i-1)	Y pixels to undercut
n...n	0 to 9	Numeric linear data, length 13 [1]
|	| (optional)	Vertical bar separates primary linear data from secondary 2-D data
p...p	2-D data (optional)	Additional 2-D data [2]

[1] The application identifier is not encoded in the symbol nor is the last check digit; the user should enter in a 13-digit value. The decoding system will display the application identifier and calculate the check digit.

[2] The separator row height for two-dimensional composite is fixed at one times the pixel multiplier.

Syntax for the GS1 DataBar Expanded barcode (spaces added for readability):

a W1 k c d eee ffff gggg h i j m nn p...p | q...q

Field	Valid Inputs	Meaning
a	1,2,3, and 4	Rotation
W1	W1	Fixed value, extended barcode set
k	k	Selects GS1 barcode
c	1 to 9, A to Z, and a to z	Wide bar ratio, default = 2

Field	Valid Inputs	Meaning
d	1 to 9, A to Z, and a to z	Narrow bar ratio, default = 2
eee	000	No Effect
ffff	0000 to 9999	Label position, row
gggg	0000 to 9999	Label position, column
h	E	GS1 Type: E= GS1 DataBar Expanded
i	1-9	Pixel Multiplier
j	0 to (i-1)	X pixels to undercut
m	0 to (i-1)	Y pixels to undercut
nn	00 or 02-22, even only[2]	Segments per row. If it is 0, barcode is expanded linear, otherwise it is expanded stacked.
p...p	0 to 9	Subset of ISO646, including alphanumerics
|	| (optional)	Vertical bar separates primary linear data from secondary 2-D data
q...q	2-D data (optional)	Additional 2-D data [2]

[1] Separator row height for two-dimensional composite is fixed at one times the pixel multiplier.

[2] When using additional 2-D composite data, the sequence width must be at least 4.

Sample

<STX>L
D11
1W1k0000001500150E100022001234567890
121100000000100Barcode W1k
E

Result

Prints a GS1 DataBar Expanded barcode.

Limitations

X/Y pixels to undercut are not supported in phase 1.

W1k GS1 DataBar Undercut

Print GS1 DataBar barcode with undercut bar parameter support. Values of X and Y.

Syntax

1W1k0000000500050R3002001234567890

Parameters

N/

Behavior

Limitations

N/A

W1L Planet Code Barcode

Label Format Barcode ID (W1L) to print a Planet Code barcode.

Syntax

W1L

Behavior

Valid Characters: 0-9

Variable length, minimum one digit

Sample

<STX>L
D11
1W1L44050010001001234567 89
E

Result

Prints a Planet barcode.

The planet barcode is limited to a maximum magnification value of 8.

For Dotsize 1, if height magnification value passed is > 8 then it is reset to 8.

For Dotsize 2, the height-magnification value is limited to 4 (because, for dotsize =2, height-magnification = 4, the calculated height magnification is 8).

W1N-W1n Industrial 2 of 5 Barcode

Label format barcode ID to print: Industrial 2 of 5 Barcode with (W1N) or without (W1n) Human Readable text.

Syntax

W1N / W1n

Parameters

N/A

Behavior

Industrial 2 of 5 is a discrete, self-checking, continuous numeric barcode. All of the information is contained in the bars, either wide or narrow, typically in a 3:1 ratio. The space is equal to the width of the narrow bar.

Valid Characters: 0-9

Variable length, minimum one digit

Human Readable: W1N; and, Non-Human Readable: W1n

Sample

<STX>L

D11

1W1N83050010001000123456

E

Prints an Industrial 2 of 5 barcode.

Limitations

N/A

W1p Intelligent Mail Barcode (IMB)

Label Format Barcode ID (W1p) to print an Intelligent Mail Barcode (IMB).

Syntax

W1p

Parameters

See Behavior section.

Behavior

Valid Characters: 0-9

Length: 20, 25, 29 or 31 digits

Valid bar widths: The width and height multiplier values of 00 will produce a valid IMB symbol.

Usage: The barcode height field is ignored since the symbol height is United States Postal Service specific. This barcode represents a 20 digit tracking code and a zero, five, nine, or eleven digit routing code on a letter or package for the USPS.

The maximum size of the barcode is limited to Dotsize 1 and Height-Magnification of 1 (any bigger magnification causes the barcode to be truncated and hence not scanable).

Sample

<STX>L
D11
1W1p0000000500050012345670949876543210123456 78
91
E

Result

Prints an IMB barcode.

W1s-W1S Standard 2 of 5 Barcode

Label Format barcode ID to print a Standard 2 of 5 Barcode with (W1S) and without (W1s) Human Readable text.

Syntax

W1S / W1s

Parameters

N/A

Behavior

Standard 2 of 5 is a discrete, self-checking, continuous numeric barcode. All of the information is contained in the bars. Bars are either wide or narrow, typically in a 3:1 ratio. The space is equal to the width of the narrow bar.

Valid Characters: 0-9

Variable length, minimum one digit

Human Readable: W1S; and, Non-Human Readable: W1s

Sample

<STX>L

D11

1W1S83050010001001234 56

E

Prints a Standard 2 of 5 barcode.

Limitations

N/A

W1Y-W1y Code 16K Barcode

Label Format barcode ID to print a Code 16K Barcode with (W1Y) or without (W1y) Human Readable text.

Syntax

W1Y / W1y

Parameters

N/A

Behavior

Code 16K is a multi-row barcode.

Valid Characters: All ASCII characters

Variable length

Human Readable: W1Y; and, Non-Human Readable: W1y

Sample

<STX>L

D11

1W1Y33050010000100ABC123

E

Prints a Code 16K barcode.

Limitations

N/A

W1z MicroPDF417 Barcode

Label format barcode ID (W1z) to print a MicroPDF417 barcode. MicroPDF417 is a 2 dimensional barcode capable of holding large amounts of data in a small area. It provides a high level of redundancy and error checking.

Syntax

a W z c d eee ffff gggg h i j k 0 m...m

Parameters

Where:

Field	Valid Inputs	Meaning
a	1, 2, 3, and 4	Rotation
W1	W1	Fixed value, extended barcode set
z	z	Selects the MicroPDF417 barcode.
c	1 to 9, A to Z, and a to z	Module size horizontal multiplier, 0 – default size
d	1 to 9, A to Z, and a to z	Module size vertical multiplier, 0 – default size
eee	000	No Effect
ffff	0000 to 9999	Label position, row
gggg	0000 to 9999	Label position, column
h	1 to 4	Number columns
i	0 to 9 and A	Row / Error Correction index
j	0, 1	Byte Compaction Mode, 1 - best binary data compression
k	0, 1	Macro Character Substitution, 1 - disable
0	0	Fixed ASCII digit 0. Reserved for future use.
m...m	8-bit data	Data to be encoded.

The number of columns (h) and row / error correction index (i) combine to form the selection index (hi), which determines other symbol characteristics as shown in the following table:

hi	Columns	Rows	Max Errors Corrected [1]	Symbol Width [2]	Symbol Height [3]	Max Binary Data Bytes [3]	Max Alpha Characters [5]	Max Numeric Characters [5]
10	1	11	4	40	24	3	6	8
11	1	14	4	40	30	7	12	17
12	1	17	4	40	36	10	18	26
13	1	20	5	40	42	13	22	32
14	1	24	5	40	50	18	30	44
15	1	28	5	40	58	22	38	55
20	2	8	5	57	18	8	14	20
21	2	11	6	57	24	14	24	35
22	2	14	6	57	30	21	36	52
23	2	17	7	57	36	27	46	67
24	2	20	8	57	42	33	56	82
25	2	23	10	57	48	38	67	93
26	2	26	12	57	54	43	72	105
30	3	6	9	84	14	6	10	14
31	3	8	11	84	18	10	18	26
32	3	10	13	84	22	15	26	38
33	3	12	15	84	26	20	34	49
34	3	15	18	84	32	27	46	67
35	3	20	23	84	42	39	66	96
36	3	26	29	84	54	54	90	132
37	3	32	35	84	66	68	114	167
38	3	38	41	84	48	82	138	202
39	3	44	47	84	90	97	162	237
40	4	4	5	101	10	8	14	20
41	4	6	8	101	14	13	22	32
42	4	8	11	101	18	20	34	449
43	4	10	13	101	22	27	46	67
44	4	12	15	101	26	34	58	85

hi	Columns	Rows	Max Errors Corrected [1]	Symbol Width [2]	Symbol Height [3]	Max Binary Data Bytes [3]	Max Alpha Characters [5]	Max Numeric Characters [5]
45	4	15	18	101	32	45	76	111
46	4	20	23	101	42	63	106	155
47	4	26	29	101	54	85	142	208
48	4	32	35	101	66	106	178	261
49	4	38	41	101	48	128	214	313
4A	4	44	47	101	90	150	250	366

[1] Can be any combination of 1 erasures + 2 substitutions (e.g. 13 maximum number of errors corrected might include 7 erasures and 3 substitutions).

[2] Includes 1 module width of quiet zone on either side.

[3] Assumes the module height is 2 module width, and includes one module width quiet zones on top and bottom.

[4] Assumes Binary Compaction.

[5] Assumes Text Compaction.

Byte Compaction Mode (j = 1)

A value of 1 forces Byte Compaction. The compaction ratio is six 8-bit bytes of data compressed into a 5-symbol code word. See the table above for the maximum data allowed for any row/column/error correction selection index (hi).

Macro Character Substitution Disable (k=1)

By default Macro Character Substitution is enabled (k=0). When enabled, Byte Compaction has priority over Macro Character Substitution. When Macro Character Substitution is enabled, the data stream header and trailer are compacted when they conform to the following forms:

- []>R S05G S data RS E
  or
- []>R S06G S data RS E

where:

- data may not contain adjacent bytes with values RS or GS
- (RS = 3010 , 1E16 and GS = 2910 , 1D16 and E = 410 ,416)

Functions Not Supported

- General Purpose Extended Channel Interpretations, including Code-128 emulations
- Structured Append
- Reader Initialization Symbol Generation
- Module shaving

Behavior

- Valid Characters: All ASCII characters, depending on the selected options.
- Variable Length

Sample

```
<STX>L
D11
1W1z000000015010014000PDF417
121100000000100Barcode W1z
E
```

Result

Prints a MicroPDF417 barcode, default module size (cd = 00), with 1 column, 24 rows, error correction of 33%, no byte compaction, macro character substitution enabled.

W1Z Micro PDF417 Barcode with Byte Count Specifier

Label format barcode ID (W1Z) to print a MicroPDF417 barcode. MicroPDF417 is a 2 dimensional barcode capable of holding large amounts of data in a small area. It provides a high level of redundancy and error checking. The Byte Count specifier allows for data values 0x00 through 0xFF to be included within the data strings without conflicting with the DPL format record terminators.

Syntax

W1Z

Parameters

See Behavior section below,

Behavior

Specified Length – The upper case Z identifies a Micro PDF417 barcode with a 4-digit string length specifier. This allows values 0x00 through 0xFF to be included within the data strings without conflicting with the DPL format record terminators. The four-digit decimal data byte count immediately follows the four-digit column position field. This value includes all of the data following the byte count field, but does not include itself.

Sample

<STX>L
D11
1W1Z0000000150100001214000pdf<0x0D>417
121100000000100Barcode W1Z
E

Result

From the example, the barcode's data stream, 1W1Z0000000150100001214000PDF<0x0D>417, includes a Byte Count Specifier (the portion in bold), where 0012 equals the four-digit decimal data byte count and includes all bytes that follow until the end of the barcode data. Field termination is set by the byte count. <STX>, <CR>, and <0x0D> all represent single byte values of hexadecimal 02, 0D, and 0D, respectively. The Micro PDF417 barcode produced encodes "pdf<CR>417", and prints a line of text: Barcode W1Z.

System Level Commands

System-Level Commands (listed below) are used for print control as well as loading and storing fonts and graphic information. These commands can be used to override any default configuration parameter values and may be used anywhere outside the Label Formatting Command data.

- STX a Enable Feedback Characters
- STX c Set Continuous Paper Length
- STX E Set Quantity for Stored Label
- STX e Select Edge Sensor
- STX F Form Feed
- STX G Print Last Label Format
- STX I Input Image Data
- STX i Scalable Font Downloading
- STX J Set Pause for Each Label
- STX k Test Communication Port
- STX L Enter Label Formatting Command Mode
- STX m Set Printer to Metric Mode
- STX n Set Printer to Imperial Mode
- STX p Controlled Pause
- STX Q Clear All Modules
- STX q Clear Module
- STX r Select Reflective Sensor
- STX S Set Feed Speed
- STX T Print Quality Label
- STX t Test DRAM Memory Module
- STX U Label Format String Replacement Field
- STX v Request Firmware Version
- STX W Request Memory Module Information
- STX Z Print Configuration Label
- STX z Pack Module

STX a Enable Feedback Characters

Enables the feedback of hex data characters to be returned from the printer following specific events during data parsing and printing.

Syntax

<STX>a

Behavior

Printer response:

Event	Return Characters
Invalid character	0x07 (BEL)
Label printed	0x1E (RS)
End of batch	0x1F (US)

STX c Set Continuous Paper Length

This command sets the label size for applications to using continuous media. It disables the top-of-form function performed by the Media Sensor. The sensor, however, continues to monitor paper-out conditions.

Syntax

<STX>cnnnn

Parameters

Where:

- nnnn -Specifies the length of the media feed for each label format, in inches/100 or millimeters/10 (see <STX>m).

Sample

<STX>c0100

Result

The sample above sets in imperial mode a label length of 100, which equals 1.00 inch.

STX E Set Quantity for Stored Label

This command sets the number of labels for printing using the format currently in the print buffer. (The printer automatically stores the most recent format received in the buffer until the printer is reset or power is removed.) When used in conjunction with the <STX>G command, this will print the format.

Syntax

<STX>Ennnnn<CR>

Parameters

Where:

- nnnnn - A five-digit quantity, including leading zeros. <CR> - 0x0d terminates the name.

Sample

<STX>E00025
<STX>G

Result

Printer response: 25 labels of the current format in memory will be printed.

Limitations

- If no <CR> terminates the command, a four-digit quantity (nnnn) can be entered; and, specifying 9999 will cause continuous printing.

STX e Select Edge Sensor

This command enables the transmissive (see-through) sensing for top-of-form detection of die-cut and holed (notched) media.

Syntax

<STX>e

STX F Form Feed

This commands the printer to form feed to the next start of print.

Syntax

<STX>F

Behavior

The printer will form feed.

STX G Print Last Label Format

This command prints a previously formatted label and restarts a canceled batch job following the last processed label. This is used when there is a label format in the buffer.

Syntax

<STX>G

Behavior

The <STX>E command is used to enter the quantity. (Without the <STX>E command, one label will print.)

STX I Input Image Data

This command downloads images to the printer. The data that immediately follows the command string will be image data.

Syntax

<STX>Iabfnn...n<CR>data

Parameters

Where:

- a - Memory Module Bank Select.
- b - Data Type (optional); 'A' - ASCII Characters 0-9, A-F, (7 bit); omitted - 00-FF, (8 bit)
- f - Format Designator Type:
  - 'F' - 7-bit Datamax-O'Neil image load file
  - 'B' - BMP 8-bit format, flipped, black and white (B&W)
  - b' - BMP 8-bit format, B&W
  - 'I' - IMG 8-bit format, flipped, B&W
  - 'i' - IMG 8-bit format, B&W
  - 'P' - PCX 8-bit format, flipped, B&W
  - 'p' - PCX 8-bit format, B&W
  - nn...n - Up to 16 characters used as an image name.
  - <CR> - 0x0d terminates the name.
  - data - Image data
  - ‘R’ – Datamax RLE image structure

Sample

<STX>IDpTest
data...data

Result

The sample above instructs the printer to (1) receive an 8-bit PCX image sent by the host in an 8-bit data format, (2) name the image "Test", and (3) store it in Module D (with a .dim file extension).

STX i Scalable Font Downloading

The command to download TrueType (.TTF) scalable fonts to the printer.

Syntax

<STX>imtnnName<CR>xx...xdata...

Parameters

Where:

- m - The designator of the module where the font is to be saved.
- t - Type of scalable font being downloaded: T = TrueType
- nn - Two-digit font reference ID. Valid range is 03-99, 9A-9Z, 9a-9z (base 62 numbers).
- Name - The title, up to 15 characters, for this font.
- <CR> - 0x0d terminates the Name.
- xx...x - Eight-digit size of the font data, number of bytes, hexadecimal, padded with leading zeros.
- data - The scalable font data.

Sample

<STX>iDT52Tree Frog<CR>000087C2data...

Result

The sample above downloads a TrueType font to Module D, and assigns it the Font ID of 52 with the name "Tree Frog" and file extension .dtt. The size of the font data is 0x87C2 bytes long.

STX J Set Pause for Each Label

This command causes the printer to pause after printing each label. It is intended for use with the peel mechanism or tear bar when the Present Sensor option is not installed.

Syntax

<STX>J

Behavior

After removing the printed label, the PAUSE Key must be pushed in order to print the next label. (The printer must be reset to clear the <STX>J command.)

STX k Test Communication Port

This command instructs the printer to transmit the Y character from the printer's port that received this command. (Failure to receive Y could indicate an interfacing problem.)

Syntax

<STX>k

Behavior

Printer response:

- Y

STX L Enter Label Formatting Command Mode

This command switches the printer to the Label Formatting Command Mode, where the printer expects to receive only Record Structures and Label Formatting Commands. Immediate, System-Level, and Font Loading commands will be ignored until the label formatting mode is terminated with E, s, or X, (see Label Formatting Commands for additional information).

Syntax

<STX>L

STX m Set Printer to Metric Mode

This command sets the printer to interpret measurements as metric values (e.g., <STX>c0100 will equal 10.0 mm). The default is Imperial (see <STX>n).

Syntax

<STX>m

STX n Set Printer to Imperial Mode

This command sets the printer to interpret measurements as inch values (e.g., <STX>c0100 will equal 1.00 inch), and is the default mode.

Syntax

<STX>n

STX p Controlled Pause

This command will cause the printer to pause only after all previously received commands are executed, often useful between label batches. (This command will not clear the pause condition; see <SOH>B).

Syntax

<STX>p

STX Q Clear All Modules

This command instructs the printer to clear all Flash and DRAM modules; see the printer manual for module options. All stored data will be erased.

Syntax

<STX>Q

STX q Clear Module

This command clears the selected Flash or DRAM module. During normal operations if a module becomes corrupted (identifiable when the printer responds with a "No Modules Available" message to a <STX>W command) it must be cleared. All stored data will be destroyed.

Syntax

<STX>qa

Parameters

Where:

- a - Memory module designator.

STX r Select Reflective Sensor

This command enables reflective (black mark) sensing for top-of-form detection of rolled butt-cut, and fan-fold or tag stocks with reflective marks on the underside. This Media Sensor will detect a minimum mark of 0.1 inches (2.54 mm) between labels (see the Operator's Manual for media requirements). The end of the black mark determines the top of form. Use the <STX>O command to adjust the print position.

Syntax

<STX>r

STX S Set Feed Speed

This command controls the output rate of the media when the FEED Key is pressed, or when feeding white space at the end of a label.

Syntax

<STX>Sn

Parameters

Where:

- n - Is a letter value starting with 'A' and representing the desired speed in one-half IPS increments

Behavior

This is not supported in Honeywell printers.

STX T Print Quality Label

This command instructs the printer to produce a Print Quality label, a format comprised of different patterns and barcodes useful in printer setup. To capture all printed information, use the labels as wide as the maximum print width and at least four inches (102 mm) long.

Syntax

<STX>T

STX t Test DRAM Memory Module

This command is to perform a system DRAM Module memory test.

Syntax

<STX>t

Parameters

None

Behavior

Printer must have "Feedback Characters" set to "Enable" and printer returns the Module tested, Module Size, and DRAM test results.

"MODULE D: 25600K Ram Tested Good".

STX U Label Format String Replacement Field

This command places new label data into format fields to build a label. Two options are available: Exact Length and Truncated Length.

To easily keep track of fields, place all of the fields to be updated with the command at the beginning of the label format. A maximum of 99 format fields can be updated. Fields are numbered consecutively 01 to 99 in the order received.

Exact Length Replacement Field Functions – The new data string must equal the original string length and contain valid data. When the dynamic data is shorter than the length of the originally defined data field, then field will be padded with blanks.

Truncation Replacement Field Functions – A variant of the <STX>U command includes the truncate option "T", where dynamic data shorter than the originally defined field length will not be padded and the original maximum field length is maintained for subsequent replacements.

Syntax

<STX>UTnnss...s<CR>

Parameters

Where:

- T – truncation (optional)
- nn - Is the format field number, 2 digits.
- ss...s - Is the new string data, followed by a <CR>

Sample

<STX>L
1A1100001000100data field 1
161100001100110data field 2
161100001200120data field 3
Q0001
E
<STX>U01123
<STX>U02New data F2
<STX>E0002
<STX>G

Result

The sample above produces three labels. The first is formatted with the commands between <STX>L and E. The next two labels print with the replacement data contained in the <STX>U commands (see <STX>E and <STX>G). The barcode is the same length: 3 digits and nine spaces.

STX v Request Firmware Version

This command causes the printer to send its version string (same as printed on the configuration label). The version may be different from printer to printer.

Syntax

<STX>v

Sample Response

- VER: PC43d, K10.15.017249

STX W Request Memory Module Information

This command requests a memory module directory listing. Results may vary depending on printer class, model, or firmware version.

Syntax

<STX>W[b][c]a

Parameters

Where:

- b - s optional – list file size also
- c - e optional – list file extension also
- a - Data type:
    - F = Downloaded fonts
    - G = Graphics (Image)
    - L = Label formats
    - C = Configuration files
    - X = Menu language files
    - N = Plug-ins
    - M = Miscellaneous type files
    - f = Resident fonts
    - p = Entire module content (Legacy and H, A and M Print Listing Command) Not supported I and EClass)
    - * = All types

Behavior

For Menu language files (WX) and Plug-ins (WN) responds with "Available Memory" but not expected to list any files in this phase.

For Entire module content (Wp), this will not be supported in Honeywell printers. There is no response to any Wp commands.

Sample response

<STX>WF

Printer response: MODULE: D

S50 92244ttf50

AVAILABLE BYTES: 945152

MODULE: G

AVAILABLE BYTES: 852480

MODULE: X

AVAILABLE BYTES: 852480

MODULE: Y

AVAILABLE BYTES: 852480

Additional Information

Sample response if size and extension are specified:

<STX>Wse*

Printer response:

Module: D

testmsc.msc,13923 BYTES

Available Bytes: 22716K

Module: G

testfont1.dtt,95725 BYTES

testfont2.dbm,109400 BYTES

Available Bytes: 54912K

STX w Test Flash Memory Module

This command is to performs a system Flash Memory test.

Syntax

<STX>w

Parameters

None

Sample

<STX>w

Limitations

None - This command always return Flash Test Good,

STX X Set Default Module

This command, typically used prior to the loading of HP/PCL-4 formatted bitmapped fonts (see Font Loading Commands), is designed to allow the user to select between modules when downloading information. The default module is one of the following:

1. The first alpha designator of the existing modules if item 2 has not occurred.
2. The module selected by this command.

Syntax

<STX>Xa

Parameters

Where:

- a - Module designator.

STX x Delete File from Module

This command removes a specific file from the specified module. The file name is removed from the module directory and thus the file cannot be accessed.

Syntax

<STX>xmtnn...n<CR>

Parameters

Where:

- m - Module designator.
- t - The file type identification code:
- G = Image file
- L = Label format file
- F = Downloaded bitmapped font file
- S = Downloaded scalable font file
- C = Configuration file
- X = Language file
- N = Plug-in file
- M = Miscellaneous file type
- U = Unknown type – must use extension if applicable
- nn...n - The file to delete, where:
    - Font (bitmapped), three character font identifier;
    - Font (scalable), two character font identifier;
    - Graphic name, up to sixteen case sensitive alphanumeric characters; or,
    - Label format name, up to sixteen case sensitive alphanumeric characters.

Sample

<STX>xDS50

Result

The sample above deletes a downloaded scalable font with ID 50 from Module D.

STX y Select Font Symbol Set

This command selects the scalable font symbol set. The selected symbol set remains active until another symbol set is selected. Option dependent and not all symbol sets can be used with all fonts. See "Symbol Sets" specification section for complete list of "Single Byte Sets" and "Double Byte Sets".

Syntax

<STX>ySxx

Parameters

Where:

- S - Byte-size designation:
- S = Single byte symbol set
- U = Double byte symbol set
- xx - Symbol set selection.

Sample

<STX>ySPM

Result

The sample above selects the PC-850 multilingual set.

STX Z Print Configuration Label

This command causes the printer to produce a Database Configuration Label. To capture all printed information, use the labels as wide as the maximum print width and at least four inches (102 mm) long.

Syntax

<STX>Z

Behavior

The printed configuration in configuration label will include both Printer Configuration and DPL Configuration. The printer settings included in DPL Configuration are as follows:

- Default Module
- Single Byte Symbol Set
- Double Byte Symbol Set
- Font Emulation
- SCL Font Bold Factor
- Format Attributes
- Label Rotation
- DPI Emulation
- DPL Emulation
- Column DPI Emulation
- Row DPI Emulation
- SOP Emulation
- Label Store
- Units of Measure
- Column Adjust
- Row Offset
- Pause Mode
- Use British Lbs
- Feedback Characters
- Control Code Sets
- Custom SOH Char
- Custom STX Char

- Custom CR Char
- Custom CNTBY Char

STX z Pack Module

On legacy Datamax-O'Neil printers, compresses the memory module. Ignored on modern Datamax-O'Neil and Honeywell printers.

Syntax

<STX>z

Parameters

None

Sample

<STX>z

Limitations

This command is legacy and is ignored on modern Datamax-O'Neil and Honeywell printers.

Immediate Commands

Immediate commands (listed below) are high-priority commands and will be executed in front of any other commands currently in the command processing queue.

- SOH # Reset
- SOH * Reset
- SOH A Send ASCII Status String
- SOH a Send ASCII Extended Status String
- SOH B Toggle Pause
- SOH C Stop/Cancel
- SOH E Send Batch Remaining Quantity
- SOH e Send Batch Printed Quantity
- SOH F Send Status Byte

SOH # Reset

Returns all settings to last-saved settings, purges all current print jobs and clears both the communications and print buffers. Also clears DRAM memory. This command does not cause the printer to restart.

Syntax

<SOH>#

Behavior

The printer will respond with a 'T' to all active communications channels in non-auto mode upon completion.

SOH * Reset

This command forces a soft reset of the microprocessor. The printer is initialized to the same state as a power cycle.

Syntax

<SOH>*

Behavior

The printer will reset with response to host printer:

- After restart printer sends an 'R' to all active communications channels in non-auto mode

SOH A Send ASCII Status String

This command allows the host computer to check the current printer status. The printer returns a string of eight characters, followed by a carriage return. Each character (see below) indicates an associated condition, either true (Y) or false (N). Byte 1 is transmitted first. See <SOH>F for alternative response.

Syntax

<SOH>A

Behavior

The printer response is:

- abcdefgh

Where:

Possible Values	Interpretation	Transmit Sequence
a - Y/N	Y = Interpreter busy	1
b - Y/N	Y = Paper out or fault	2
c - Y/N	Y = Ribbon out or fault	3
d - Y/N	Y = Printing batch	4
e - Y/N	Y = Busy printing	5
f - Y/N	Y = Printer paused	6
g - Y/N	Y = Label presented	7
h - Y/N	Y = N (not used)	8

Limitations

For "Interpreter busy (imaging)", Honeywell behavior is not the same as CEE all the time. Honeywell printers will set it to Y during printing and reset it to N after printing.

SOH a Send ASCII Extended Status String

This command allows the host computer to check an extended current printer status. The printer returns a string of seventeen characters, followed by a carriage return. Most characters (see below) indicate an associated condition, either true (Y) or false (N). Byte 1 is transmitted first.

Syntax

<SOH>a

Behavior

The printer response is:

- abcdefgh:ijklmnop:qrstuvwx

Where:

Possible Values	Interpretation	Transmit Sequence
a - Y/N	Y = Interpreter busy	1
b - Y/N	Y = Paper out or fault	2
c - Y/N	Y = Ribbon out or fault	3
d - Y/N	Y = Printing batch	4
e - Y/N	Y = Busy printing	5
f - Y/N	Y = Printer paused	6
g - Y/N	Y = Label presented	7
h - Y/N	Y = N (not used)	8
:	: = Always:	9
i - Y/N	Y = Cutter Fault	10
j - Y/N	Y = Paper Out	11
k - Y/N	Y = Ribbon Saver Fault	12
l - Y/N	Y = Print Head Up	13
m - Y/N	Y = Top of Form Fault	14
n - Y/N	Y = Ribbon Low	15
o - Y/N	Y = N (reserved for future)	16
p - Y/N	Y = N (reserved for future)	17
:	: = Always:	18

Possible Values	Interpretation	Transmit Sequence
q - Y/N	Ready (no data or signal)	19
r - Y/N	Waiting for Signal	20
s - Y/N	Waiting for Data	21
t - Y/N	Com1 has data not parsed	22
u - Y/N	Y = N (reserved for future)	23
v - Y/N	Y = N (reserved for future)	24
w - Y/N	Y = N (reserved for future)	25
x - Y/N	Y = N (reserved for future)	26

The printer response size may grow as new requirements are defined. The response will always be backward compatible and terminated with a <CR>. The user should not assume a fixed length response.

Limitations

For "Interpreter Busy" (imaging), Honeywell behavior is not the same as CEE all the time. Honeywell printers will set it to Y during printing and reset it to N after printing.

The following are not supported in Honeywell printers and are always 'N', except for q being always 'Y'.

- k - Y/N Y = Ribbon Saver Fault 12
- q - Y/N Y = Ready (no data or signal) 19
- r - Y/N Y = Waiting for Signal 20
- s - Y/N Y = Waiting for Data 21
- h - Y/N Y = Rewinder out or fault 8
- m - Y/N Y = Top of Form Fault 14

SOH B Toggle Pause

This command toggles the printer's paused state between "On" and "Off." (This is the same function achieved by pressing the PAUSE Key.)

Syntax

<SOH>B

Behavior

This command will illuminate the Paused/Stop Indicator and/or indicate PAUSED on the LCD or graphics display panel, suspend printing, and wait until one of the following occurs:

- The <SOH>B command is sent to the printer.
- The PAUSE Key is pressed.

Upon which the printer will turn the Paused/Stop Indicator "Off" and/or remove PAUSED from the LCD or graphics display, then resume operation from the point of interruption. (If the Receive Buffer is not full, an <XON> character will be transmitted from the printer.)

SOH C Stop/Cancel

This command performs the cancel print job function (i.e., it clears the current format from the print buffer, pauses the printer, and illuminates the Paused/Stop Indicator). (The pause condition is removed as described under <SOH>B.)

Syntax

<SOH>C

Behavior

The print buffer is cleared and the Paused/Stop Indicator is illuminated (and/or PAUSED is displayed on the LCD or graphics display) as operations are suspended, until one of the following occurs:

- The <SOH>B command is sent to the printer; or
- The PAUSE Key is pressed.

Upon which the printer will turn the Paused/Stop Indicator "Off" and/or remove PAUSED from the LCD or graphics display. (If the Receive Buffer is not full, an <XON> character will be transmitted from the printer.)

SOH E Send Batch Remaining Quantity

This command returns a four or five digit number indicating the quantity of labels that remain to be printed in the current batch, followed by a carriage return.

Returned values is four digits if specified quantity is <= 9998. Five digits for quantities specified > 9999. A value of 9999 is a special case and is to print forever and always returns 9999.

Communications latency may cause this value to be higher than actual on some printers.

Syntax

<SOH>E

Behavior

Printer response is:

- nnnn<CR> or nnnnn

Where: nnnn - Are four or five decimal digits, 0000-9999 or 00000-99999. Based on quantity specified.

SOH e Send Batch Printed Quantity

This command causes the printer to return a 5-digit number indicating the quantity of labels that have been printed in the current batch, followed by a carriage return.

Communications latency may cause this value to be lower than actual on some printers.

Syntax

<SOH>e

Behavior

Printer response is:

- nnnnn

Where: nnnnn - are five decimal digits, 00000 to 99999.

SOH F Send Status Byte

This command instructs the printer to send a single status byte where each bit (1 or 0) represents one of the printer's status flags, followed by a carriage return (see below). If an option is unavailable for the printer, the single bit will always be zero. See <SOH>A.

Syntax

<SOH>F

Behavior

Printer response is:

- X

Where: "X" is a hex value byte of data 0x00 through 0xFF with bits as indicated in the "Condition" column below:

Bit*	Bit* Value	Condition
8	1 or 0	Not used - always 0
7	1 or 0	Label presented
6	1 or 0	Printer paused
5	1 or 0	Busy printing
4	1 or 0	Printing batch
3	1 or 0	Ribbon out or Fault
2	1 or 0	Paper out or Fault
1	1 or 0	Interpreter busy (imaging)

*One is the least significant bit.

Limitations

For "Interpreter busy (imaging)", Honeywell behavior is not the same as CEE all the time. Honeywell printers will set it to Y during printing and reset it to N after printing.

Label Format Commands

Label Formatting Commands (see links below) control print operations within the System <STX>L (start label format) command. They override the System Commands as well as any default database parameter values.

- Label Formatting Commands
- Format Record Commands
- Barcode

Label Formatting Commands

The <STX>L command switches the printer from the System-Level Processor to the Label Formatting Processor. All commands following the <STX>L are interpreted as label formatting commands, and can be used to override default parameter values. Selectable parameter value defaults may be also reassigned via the Setup Menu, as defined in the corresponding Operator's Manual. Label formats that contain no commands overriding printer default values will assume those defaults.

- A Set Format Attribute
- B Barcode Magnification
- C Set Column Offset Amount
- D Set Dot Size Width and Height
- E Terminate Label Formatting Mode and Print Label
- e Recall Printer Configuration
- F Advanced Format Attributes
- G Place Data in Global Register
- H Enter Heat Setting
- J Justification
- M Select Mirror Mode
- m Set Metric Mode
- n Set Inch (Imperial) Mode
- P Set Print Speed
- Q Set Quantity of Labels to Print
- R Set Row Offset Amount
- r Recall Stored Label Format
- s Store Label Format in Module
- T Set Field Data Line Terminator
- U Mark Previous Field as a String Replacement Field
- X Terminate Label Formatting Mode
- y Select Font Symbol Set
- z Zero (Ø) Conversion to "0"
- + | > | (Make Last Field entered an Increment Field
- – |< |) Make Last Field entered a Decrement Field
- STX S Recall Global Data and Place in Field

- STX T Print Time and Date
- ^ Set Count by Amount

A Set Format Attribute

This command specifies the type of format operation and remains in effect until another format command is specified or another label format has begun (<STX>L).

Syntax

An

Parameters

Where:

- n - Is attribute mode 1, 2, 3, or 5; see table below. The default is 1.

n	Attribute	Description
1	XOR Mode	In this mode, the region where text strings, images or barcodes intersect will not be printed. (An odd number of overlapping objects will print.)
2	Transparent Mode	The intersecting regions of text strings, images, and barcodes will print, allowing the user to print fields atop one another.
3	Opaque Mode	Intersecting text is obliterated by the text formatted last. Each character cell is treated as opaque. This mode is effective only in rotation 1. See Record Structure
5	Inverse Mode	This mode allows inverse (white on black) printing (e.g., a proportionally sized border and background are printed similar to photographic negative). If text or image fields overlap in this mode, the effect will be similar to the XOR mode.

Sample

<STX>L
A3
141100001000100DATAMAX
141100001100110DATAMAX
E

Result

The sample above sets the printer to Opaque Mode and produces one label.

B Barcode Magnification

This command provides a mechanism to specify the barcode magnification.

Syntax

Bnn

Parameters

Where:

- nn - Is a two digit decimal number indicating the magnification value.

Sample

```
<STX>L
D11
B01
1a9305000100030ABCD
B03
1a3105000700030ABCD
Q0001
E
```

Result

The sample above instructs the printer to print two barcodes, each 9 dots by 3 dots. The value is reset to 1 at the start of every label and stays active for the entire label or set to a new value.

C Set Column Offset Amount

This command allows horizontal adjustment of the point where printing begins. The printer is instructed to print label formats nnnn units to the right of the position that the format specifies. This feature is useful when a single format is to be printed on labels containing preprinted information.

Syntax

Cnnnn

Parameters

Where:

- nnnn - Is a four-digit number for the column offset, inches/100 or mm/10. The default is 0.

Sample

<STX>L
C0050
1411000010000100DATAMAX

Result

The sample above shifts all format data 0.5 inches to the right, unless the printer is in metric mode (see Label Formatting Command "m").

D Set Dot Size Width and Height

This command is used to change the size of a printed dot, hence the print resolution - dots per inch (DPI) of the print head. By changing the height of a dot, the maximum length of a label can be increased or decreased.

Syntax

D<wh>

Parameters

Where:

- w - Is Dot Width multiplier 1 or 2.
- h - Is Dot Height multiplier 1, 2, or 3.

Limitations

D11 is the default value for 300, 400 and 600 DPI printer models, while D22 is the default value for all 203 DPI printer models.

E Terminate Label Formatting Mode and Print Label

This command causes the printer, when the processing Label Formatting commands, to terminate the Label Formatting Mode then generate, print, and feed a label. The label generated will be based on whatever data has been received to that point, even if no printable data has been received. (Other termination commands are "X" and "s".) Commands sent to the printer after the Terminate Label command must be of the Immediate, System-Level, or Font Download type.

Syntax

E

Sample

<STX>L
1211000000000000Testing
E

Result

The sample above will print one label.

e Recall Printer Configuration

This command recalls a previously stored printer configuration. It is highly recommended that only one Recall Printer Configuration command be used per label, and that it be used at the beginning of the label; otherwise, unpredictable results will occur. (Printer configurations may be stored using the Extended System-Level Commands or via the printer's menu system.)

Syntax

eName<CR>

Parameters

Where:

Name - The name, up to 16 characters, of the configuration file.

<CR> - 0x0d terminates the name.

Sample

<STX>L<CR>

ePlant1<CR>

1A2210001000000Testing<CR>

E<CR>

The sample above recalls the stored printer configuration, Plant1.

Limitations

N/A

F Advanced Format Attributes

These commands extend the text presentation capabilities for Scalable Fonts. The format attribute allows a set of label format records to select Bolding, Italicizing, etc. Additional commands allow the specification of line rotation and font changes within a label field.

Two different advanced formatting attributes extend the text presentation capabilities. The first format attribute allows a set of label format records to make a state change that modifies the font attributes of any following DPL text records. The second format attribute provides a means of inserting text and font formatting commands directly into the DPL data stream via a command delimiter structure. All label formats begin by default with attributes disabled. The table below represents the current list of font attributes available to the user. Note that these commands are delimited by the \<xxx> sequence (where xxx is from the list below).

Syntax

Fa

Parameters

Where:

Command	Units	Purpose	Notes
FB	+/-	Turns font boldfacing on or off	minus "-" is disable; or, plus "+" is enable
FI	+/-	Turns font italicization on or off	minus "-" is disable; or, plus "+" is enable
FP*n*	Points	Specifies the vertical point size of the following text relative to the baseline.	
FS*n*	Points	Specifies the horizontal point size of the following text relative to the baseline.	

Behavior

Sample:

<STX>L

D11

FA+

FB+

1911S0102600040P018P018New DPL World

FI+

1911S0102000040P018P018New DPL World

FI-B-

1911S0101400040P018P018New DPL World

FB+

1911S0100800040P018P018New DPL World

FB+I+

1911S0100200040P018P018New DPL World

FB-

E

Note: *Note that if all format commands after the first FB+ were deleted the entire label would have been printed with bold scalable fonts. This is what is meant by a state change. Once invoked, that command is in affect until turned off or the label format is terminated with the "E" "s" or the "X" command.*

Limitations

N/A

G Place Data in Global Register

The "G" command saves the print data of a print format record in a global register (temporary storage). This data may be retrieved and copied to another record in the same label format using the special Label Formatting Command: <STX>S. Global registers are named in the order received, beginning with Register A, ending at Register Z, and incrementing with each instance of the G command use.

Syntax

G

Sample

<STX>L
1211000000000000Testing
G
1A2210001000000<STX>SA
E

Result

The sample above stores, retrieves, and prints the data in global register A. One label is printed with "Testing" in two locations.

H Enter Heat Setting

This command changes the "on time" of elements of the print head. The default setting is 10 (except in the case of printers with a menu, where the default setting can be changed through the keypad). An increase or decrease in this value results in a change of heat applied by the print head to the media, lightening or darkening the print contrast accordingly. This is helpful when using different media types, each requiring a different amount of heat to properly image the media. The host device can send this command value to correct the heat setting per the application.

Syntax

Hnn

Parameters

Where:

- nn - Is a two-digit heat value (00-30).

Sample

<STX>L
H15
1411000010000100SAMPLE LABEL
E

Result

The sample above sets the printer for a heat value of 15 and prints one label.

J Justification

This command changes the printing justification.

Syntax

Ja

Parameters

Where:

- a - Is a single-digit alpha character:
    - L = left justified (default)
    - R = right justified
    - C = center justified

Sample

<STX>L
1911A1801001000TEST1
JR
1911A1801000100TEST2
JC
1911A1802000200TEST3
E

Result

The sample above prints "TEST1" one inch up and one inch over going right, "TEST2" one inch up and one inch over going left, and "TEST3" two inches up and over.

M Select Mirror Mode

This command instructs the printer to "mirror" all subsequent print field records, producing fields that are transposed visually.

Syntax

M

Behavior

Once set in a label format, Mirror Mode cannot be turned off until the end of the format

m Set Metric Mode

This command sets the printer to measure in metric. When this command is sent, all measurements will be interpreted as metric values, (e.g., a column offset of 0010 will be interpreted as 1.0 mm).

Syntax

m

Sample

<STX>L
m
1411000010000100SAMPLE LABEL
E

Result

The sample above prints the text (SAMPLE LABEL) starting at location coordinates 10.0 mm, 10.0 mm.

n Set Inch (Imperial) Mode

This command sets the printer to measure in inches. When this command is sent, all measurements will change to inches. Default mode, and is menu selectable.

Syntax

n

Sample

<STX>L
n
1411000010000100SAMPLE LABEL
E

Result

The sample above prints the text (SAMPLE LABEL) starting at location coordinates 1.0 inch, 1.0 inch.

P Set Print Speed

This command sets a print speed for a label or batch of labels.

Syntax

Pa

Parameters

Where:

- a - Is a single character representing a speed.

Sample

<STX>L
PC
1411000001000100LABEL1
E
<STX>L
1411000001000100LABEL2
E

Result

The sample above prints two labels, the first at a speed of 2 inches per second (51 mm per second) and the second at the default setting.

Q Set Quantity of Labels to Print

This command sets the number of the label copies to be printed. A one to five digit value is allowed, if the command is delimited by a carriage return <CR>. This permits host applications to generate label quantity commands without the need to pad leading zeros. (A four-digit command value does not need to be <CR> terminated.)

Syntax

Qnnnnn

Parameters

Where:

- nnnnn - Is a one to five-digit delimited value setting for the number of labels to be printed. The default value is one.

Limitations

Specifying 9999 as the four-digit quantity results in continuous printing.

R Set Row Offset Amount

This command allows vertical adjustment of the point where printing begins. The printer is instructed to print label formats nnnn units above the position that the format specifies. This feature is useful when a single format is to be printed on labels containing preprinted information.

Syntax

Rnnnn

Parameters

Where:

- nnnn - Is a four-digit number (0000-9999) for the row offset, in inches/100 or millimeters/10. The default is 0.

Sample

<STX>L
R0037
1411000010000100SAMPLE LABEL
E

Result

The sample above prints a label with a row offset amount of .37 inches, unless in metric mode.

r Recall Stored Label Format

This command is used to retrieve label formats stored on a memory module.

Syntax

rnn...n

Parameters

Where:

- nn...n - Is a label name, up to 16 characters in length. The name is case-sensitive.

Sample

<STX>L
rTEST
Q0002
E

Result

This sequence begins label format, retrieves format named TEST, quantity requested = 2, terminates formatting and prints. Embedding recalled labels, up to 6 levels of nesting.

s Store Label Format in Module

This command stores a label format to a specified module as a .dlb file. Supplying the module name will store the label to that module; otherwise, using C will cause the label format to be stored in the selected default module (see <STX>X). In addition, this command terminates the Label Formatting Command.

Syntax

sann...n

Parameters

Where:

- a - Is the module designator representing a single character module name.
- nn...n - Represents the name of the label (maximum 16 characters). The name is case-sensitive.

Sample

<STX>L
D11
191100501000000123456789012
19110050200000001234567
191100500000000Sample
1X1100000000000B250250002002
Q0001
sATEST

Result

The sample above stores a format in Memory Module A and names it "TEST". (To recall a label format from the module, use the "r" command.)

T Set Field Data Line Terminator

This command, intended for use with record types that accept binary data (e.g., PDF417), allows binary control codes (e.g., a carriage return) to be embedded in the printed data by setting an alternate data line terminator. Valid only for the next format record, the terminator then defaults back to the carriage return.

Syntax

Tnn

Parameters

Where:

- nn - Is an ASCII two-character representation of a HEX code to be used for the end of data terminator.

Sample

<STX>L
T00
1911002000000000TEST<NULL>
14110000100010OTERMINATOR
Q0001
E

Result

The sample above sets a NULL terminator (ASCII NULL: HEX 00) for the data line termination code. The terminator is immediately restored to a carriage return <CR>, as seen in the format record containing the text "TERMINATOR".

U Mark Previous Field as a String Replacement Field

This command controls the formatting of replacement data. Specifying a field as a string replacement for dynamic, not static, fields will optimize throughput. See <STX>U.

Syntax

U

Sample

<STX>L
D11
121100001000000123456789012
U
121100002000001234567
U
161100000000000Sample
1X1100000000000B250250002002
Q0001
E
<STX>U01ABCDEFGHIJKL
<STX>U028901234
<STX>G

Result

The sample above sets the format for register loading and prints two labels. The first two of four format records have been designated replacement fields. The second label is generated with System-Level field-replacement commands and printed.

The length of the original string sets the data string length of any replacement; both must be equal. The data being used when created must be valid for the font type being selected.

X Terminate Label Formatting Mode

This command causes the printer, when in label formatting mode, to immediately switch to the system command mode and generate a label format based on the data received at that point. However, unlike the "E" command, it will not print a label. (Other termination commands are the "E" and "s".)

Syntax

X

Sample

<STX>L
1411000010001OOSAMPLE
X

Result

The sample above will result in a label format, but no label will be printed.

y Select Font Symbol Set

This command, like the <STX>y, selects the scalable font symbol set. The selected symbol set remains active until another symbol set is selected. See "Symbol Sets" specification section for complete list of "Single Byte Sets" and "Double Byte Sets".

Syntax

ySxx

Parameters

Where:

- S - Byte-size designation:
    - S = Single byte symbol sets
    - U = Double byte symbol sets.
- xx - Symbol set selection.

z Zero (Ø) Conversion to "0"

This command removes the slash zero in fonts 0 to 8, and in the human readable field (if any) of the barcodes A to Z. The command applies only to format records containing those fonts and barcodes, and is effective only for the label format in which it appears.

Syntax

z

Sample

<STX>L
z
1211000000000000Test0000
E

Result

None of the smooth fonts (i.e., Font 9) use the slash zero convention, and this command will have no effect on scalable fonts.

+ | > | (Make Last Field entered an Increment Field

This command is used to print sequenced labels. It causes the printer to automatically increment a field in a batch of labels. The numeric data in the field will increment by the value assigned after the plus sign (+) each time a label is produced [or the greater than symbol [>] can be substituted to make the field increment alphabetically, or the left parenthesis [(] can be substituted to make the field increment hexadecimal data (valid hexadecimal data is 0-9 or A-F, usually in pairs)]. This command is effective only on the label format record that it follows, and is intended to be used with the Q, <STX>E, or <STX>G commands.

Syntax

*pii

Parameters

Where:

- * - Is "+" for numeric increment, ">" for alphanumeric increment, or "(" for hexa-decimal increment.
- p - Is the fill character for the left-hand character of the field.
- ii - Is a mask for the amount by which to increment the field.

Sample

<STX>L
13220000000000012345
+01
Q0003
E

Result

The sample above will generate a single field label format that prints the initial label with a value of 12345, and then increments that number by one for the next two labels.

Embedding

Numeric strings for incrementing may also be embedded between alphabetic characters (e.g., when systems require alphanumeric barcodes with alphabetic prefixes or suffixes).

Sample

<STX>L
161100000100010AB0001CD
+ 100
Q0003
E

Result

The sample above will print three labels, incrementing 0001 by 1 on each label with AB and CD remaining untouched: AB0001CD, AB0002CD, AB0003CD. Note that the increment value has one leading blank and two trailing zeros, while the blank is a pad character and the trailing zeroes are placeholders that leave CD unchanged.

– |< |) Make Last Field entered a Decrement Field

This command is used to print sequenced labels. It causes the printer to automatically decrement a field in a batch of labels. The numeric data in the field will decrement by the value assigned after the minus (-) sign each time a label is produced [or the less than character [<] can be substituted to make the field decrement alphabetically, or the right parenthesis [)] can be substituted to make the field decrement hexadecimal data (valid hexadecimal data is 0-9 or A-F, usually in pairs)]. This command is effective only on the label format record that it follows, and is intended to be used with the Q, <STX>E or <STX>G commands.

Syntax

*pii

Parameters

Where:

- * - Is "–" for numeric decrement, "<" for alphanumeric decrement, or ")" for hexadecimal decrement.
- p - Is the fill character for the left-hand character of the field.
- ii - Is a mask for the amount by which to decrement the field.

Sample

<STX>L
1322000000000000123AB
<01
Q0003
E

Result

The sample above will generate a single field label format that prints the initial label with a value of 123AB, and then decrements that number by one for the next two labels.

Embedding

Numeric strings for decrementing may also be embedded between alphabetic characters (e.g., when systems require alphanumeric barcodes with alphabetic prefixes or suffixes).

<STX>L
16110000010001010000CD
100
Q0003
E

Result

The sample above will print three labels: 1000CD, 999CD, and 998CD. Note that the pad character is a placeholder for digits removed from the left side in the subtraction process. When a fixed pitch font is used, the justification of the rightmost character is sustained regardless of the number of digits replaced by the pad character on the left side.

STX S Recall Global Data and Place in Field

This command, when in the format record data field, places data from a specified global register into the data field. See the G command.

Syntax

<STX>Sn

Parameters

Where:

- n - Specifies the global register ("A" - "Z") that contains the data to place into the data field.

Sample

<STX>L
121100000000000DMX
G
1A2210001000000<STX>SA
E

Result

The sample above places the string "DMX" into the next available global register (A), and then line 4 is effectively replaced by the data from global register A.

STX T Print Time and Date

This command, using string characters and markers, allows time and date data to be selected and retrieved from the internal clock. In addition, the <STX>T may be preceded by data to be printed/encoded, and/or the string may be terminated by an <STX> command followed by more data then <CR> terminated. The string characters/markers are not printed; instead, the label will show the corresponding print value.

Syntax

<STX>Tstring<CR>

Parameters

Where:

- string - Is any set of characters, A - Z and a – h; see the table below.

String Characters	Print Values	String Markers	Print Values
A	Week Day (Mon = 1, Sun = 7)	VW	24-hour time format
BCD	Day Name	XY	12-hour time format
EF	Month Number	Za	Minutes
GH...O	Month Name	gh	Seconds
PQ	Day	bc	AM or PM
RSTU	Year	def	Julian Date

Sample

<STX>L
121100001000100<STX>TBCD GHI PQ, TU
E

Result

Sample 1 prints SUN DEC 21, 98

The samples above assume a current printer date of December 21, 1998.

^ Set Count by Amount

This command allows applications using the increment / decrement field command to print more than one label with the same field value before the field data is updated. The default is 1.

Syntax

^nn

Parameters

Where:

- ^ - 0x5E or 0x40 if using Alternate or Alternate 2 Control Codes.
- nn - Is a two-digit value that specifies the number of labels to be generated before incrementing (or decrementing) the field value.

Behavior

This command can only be issued once per label format. In addition, when alternate Control Codes are enabled, the ^ character must be replaced by the @ character (hexadecimal 0x40); see Control Code Command Functions.

Sample

<STX>L
13220000000000012345
-01
^02
Q0006
E

Result

The sample above prints two labels containing the same field value before decrementing the field. Six labels are printed.

Font Loading Commands

These commands are utilized to send bitmap fonts to the printer. The assigned font ID number command must be sent to the printer before the font file. All Font Loading Commands begin with <ESC> (ASCII control character 27 [decimal]). The downloaded font will be stored in the default module (refer to the <STX>X command) as file type .dbm. The commands in the table below are listed in their order of appearance, top to bottom, during font downloading. The <SOH>D command must be sent prior to downloading a font.

- *c###D Assign Font ID Number
-)s###W Font Descriptor
- *c###E Character Code
- (s#W Character Download Data

*c###D Assign Font ID Number

This command is the first command required for downloading a font to either RAM or Flash Memory modules. ESC represents the ASCII control character 27.

Syntax

<ESC>*c###D

Parameters

Where:

- ### - Is the font ID numbers 100-999 (000 – 099 are reserved for resident fonts).

)s###W Font Descriptor

This command (typically first data in a font file) contains all of the information about the font contained in the file. Different font generation software will create different length header information, but the initial 64 bytes will remain consistent with the PCL-4 (HP LaserJet II) format.

Syntax

<ESC>)s###Wddd...d

Parameters

Where:

- ### - Is the number of bytes of font descriptor data from 1 to 3 ASCII decimal digits.
- dd...d - Is the descriptor.

*c###E Character Code

This code is the ASCII decimal value corresponding to the next downloaded character.

Syntax

<ESC>*c###E

Parameters

Where:

- ### - Is the ASCII value of the character, three digits maximum, 0 to 999.

(s#W Character Download Data

This command contains all of the information for one downloaded character.

Syntax

<ESC>(s###Wnn...n

Parameters

Where:

- ### - Is the number of bytes of bitmapped data, three digits maximum, from 1 to 999.
- nn...n - Is the bitmapped data.

Extended System Level Commands

Extended System-Level Commands are extensions to the System-Level Commands and provide an extra level of printer control, some of which can be used to set the printer's default database values.

Note: These commands are retained on power-cycling the printer.

- STX KC Get Configuration
- STX KE Character Encoding
- STX Kf Set Present Distance
- STX KH Dot Check
- STX Kr Resettable Counter Reset

STX KC Get Configuration

This command returns the configuration of the printer. The form of the returned data is similar to that of a printed Configuration Label. This command should be parsed by KEYWORDS, not character positions. Each line is terminated by a CR (0x0d) & LF (0x0a).

Syntax

<STX>KC<CR>

Behavior

Responds with Printer Configuration and DPL configuration. The printer settings included in DPL Configuration are as follow:

- Default Module
- Single Byte Symbol Set
- Double Byte Symbol Set
- Font Emulation
- SCL Font Bold Factor
- Format Attributes
- Label Rotation
- DPI Emulation
- DPL Emulation
- Column DPI Emulation
- Row DPI Emulation
- SOP Emulation
- Label Store
- Units of Measure
- Column Adjust
- Row Offset
- Pause Mode
- Use British Lbs
- Feedback Characters
- Control Code Sets
- Custom SOH Char
- Custom STX Char

- Custom CR Char
- Custom CNTBY Char

Limitations

The format of the displayed information will vary with printer, model, firmware version, and equipped options.

STX KE Character Encoding

This command is provided primarily as a means for users of 7-bit communication and to embed control characters and extended ASCII characters in their data streams. Any character in the DPL data stream may be substituted with a delimited two-character ASCII hexadecimal numeric equivalent. The command allows the delimiting character to be selected, and the encoding to be enabled or disabled. When character encoding is enabled, the printer will decode any ASCII hexadecimal numeric pairs following the delimiter as single-byte values. Character encoding is used where control characters cannot be transmitted or where control characters within data may prematurely terminate a label format record. Although the delimiter may be changed at any time (except within a label format definition), there cannot be more than one defined delimiter, and character encoding must be disabled with <STX>KEN prior to re-enabling regardless of any change in the delimiter.

Syntax

<STX>KEex<CR>

Parameters

Where:

- e - Y - character encoding enabled
- N - character encoding disabled
- x - Delimiter: one ASCII character (Do not include when e = N)

Sample

<STX>KEN
<STX>KEY\
<STX>L
1u0000001200120[)>\1E\01\1D\...\04\
E

Result

The sample above disables, and then enables character encoding with the backslash (\) as the delimiter. A UPS MaxiCode will be formatted using a data string interpreted as follows: [)>R S01GS...EOT<CR> then formatting is terminated.

STX Kf Set Present Distance

This command specifies an additional amount to advance the label after printing. This command has the same effect as the <STX>f command, but specifies a distance to advance relative to the start of print (<STX>O command) of the next label. Stop Location must be set to Host and Ignore TOF Sensing Command disables this command.

Syntax

<STX>Kfnnnn<CR>

Parameters

Where:

nnnn - A four-digit present distance in inches/100 or mm/10.

Behavior

Sample:

<STX>Kf0100>

The sample above represents a one-inch label advance unless in metric mode (see <STX>m).

Limitations

N/A

STX Kr Resettable Counter Reset

This command resets the internal counters. Follow this command with an <SOH>U command to retain the reset or the counters will revert to the previous values after cycling power.

Syntax

<STX>Kr<CR>

Parameters

N/A

Behavior

N/A

Limitations

<SOH>U will not be supported.

Only reset Odometer (User Resettable).

STX KH Dot Check

This command specifies dot check operations for the printhead elements.

Syntax

<STX>KHx<CR>

Parameters

x - Specifies the operation, where:

P = Performs dot check;

A = Returns the most recent dot check and dot resistance results; and,

B = Returns the most recent dot check failed dot results.

Behavior

1. <STX>KHP<CR>

The sample above performs dot check.

2. <STX>KHA<CR>

The sample above returns results from the last dot check for every element and its resistance up to 1350 ohms [with out of range (bad or suspect) values indicates as ******], the number of dots tested, the total number of bad or suspect dots detected and, the minimum, maximum, and average resistance and variance.

3. <STX>KHB<CR>

The sample above returns results from the last dot check for the number of elements tested, the number of the bad or suspect dot(s), the total number of bad or suspect dots, and the minimum, maximum, and average resistance and variance.

The process normally adds a few seconds to the power-up sequence; however, if the printhead is invalid or extremely damaged, it could take a minute to complete.

Limitations

PC43 printer does not support dot checking (whereas E Class printer supports).

CHAPTER

2

SYMBOL SETS

Single and Double Byte Symbol Sets

Use the symbol set commands to select the symbol sets (code pages) for your specific language needs.

Double Byte Sets

Doubled Byte Fonts Symbol Set Selections

Double Byte Character Map		
Character Map ID	**TrueType Font**	**Description**
B5	✓	BIG 5 (Taiwan) Encoded
EU	✓	EUC (Extended UNIX Code)
GB	✓	Government Bureau Industry Standard; Chinese (PRC); default
JS	✓	JIS (Japanese Industry Standard); default
SJ	✓	Shift JIS
UC	✓	Unicode (including Korean)

Single Byte Sets

Single Byte Symbols Set Selections:

Code Page Identifier		Font Format			Description
		MicroType		True Type	
Datamax-O'Neil	HP (PCL)	CG Triumvirate	CG Times		
AR	8V	X	✓	✓	Arabic-8
CP	3R	Part	✓	✓	PC Cyrillic
D1	11L	X	X		ITC Zapf Dingbats/100
D2	12L	X	X		ITC Zapf Dingbats/200
D3	13L	X	X		ITC Zapf Dingbats/300
DN	0D	Part	Part	✓	ISO 60 Danish / Norwegian
DS	10L	X	X		PS ITC Zapf Dingbats
DT	7J	✓	✓	✓	DeskTop
E1	0N	✓	✓	✓	ISO 8859/1 Latin 1
E2	2N	✓	✓	✓	ISO 8859/2 Latin 2
E5	5N	✓	✓	✓	ISO 8859/9 Latin 5
E6	6N	✓	✓	✓	ISO 8859/10 Latin 6
E7	12N	X	X	✓	ISO 8859/7 Latin/Greek
E9	9N	✓	✓	✓	ISO 8859/15 Latin 9
EG	12N	Part	✓	✓	ISO 8859/7 Latin/Greek
EH	7H	Part	✓	✓	ISO 8859/8 Latin/Hebrew
ER	10N	Part	✓	✓	ISO 8859/5 Latin/Cyrillic
FR	1F	Part	Part	✓	ISO 69: French

Code Page Identifier		Font Format			Description
		MicroType		True Type	
Datamax-O'Neil	HP (PCL)	CG Triumvirate	CG Times		
G8	8G	Part	✓	✓	Greek-8
GK	12G	Part	✓	✓	PC-8 Greek
GR	1G	Part	Part	✓	ISO 21: German
H0	0H	Part	✓	✓	Hebrew-7
H8	8H	Part	✓	✓	Hebrew-8
IT	0I	✓	✓	✓	ISO 15: Italian
L$ [1]	14L	X	X	✓	HP4000 ITC Zapf Dingbats
LG	1U	✓	✓	✓	Legal
M8	8M	✓	✓	✓	Math-8
MC	12J	✓ [1]	✓	✓ [1]	Macintosh
MS	5M	✓	✓ [1]	✓ [1]	PS Math
P9[1]	13U	✓	✓ [1]	✓ [1]	PC-858 Multilingual
PB	6J	Part	Part	✓	Microsoft Publishing
PC	10U	✓	✓	✓	PC-8, Code Page 437
PD	11U	✓	✓	✓	PC-8 D/N, Code Page 437N
PE	17U	✓	✓	✓	PC-852 Latin 2
PG	10G	Part	✓	✓	PC-851 Latin/Greek
PH	15H	✓	✓	✓	PC-862 Latin/Hebrew
PI	15U	Part	Part	✓	Pi Font
PM	12U	✓ [1]	✓ [1]	✓ [1]	PC-850 Multilingual
PR	10V	✓	✓	✓	PC-864 Latin/Arabic
PT	9T	✓	✓	✓	PC-8 TK, Code Page 437T
PU	9J	✓	✓	✓	PC-1004
PV	26U	✓	✓	✓	PC-775 Baltic

Code Page Identifier		Font Format			Description
		MicroType		True Type	
Datamax-O'Neil	HP (PCL)	CG Triumvirate	CG Times		
PX	12U	X	X		PTXT3000
PY	3Y	X	X	✓	Non-UGL, Generic Pi Font
R8	8U	✓	✓	✓	Roman-8
R9[1]	4U	✓	✓ [1]	✓ [1]	Roman-9
SP	2S	✓	✓	✓	ISO 17: Spanish
SW	0S	✓	✓	✓	ISO 11: Swedish
SY	19M	X	X	✓	Symbol
TK	8T	X	X		Turkish-8
TS	10J	✓	✓	✓	PS Text
UK	1E	✓	✓	✓	ISO 4: United Kingdom
US	0U	✓	✓	✓	ISO 6: ASCII
U8	-	✓	✓	✓	UTF8
VI	13J	✓	✓	✓	Ventura International
VM	6M	✓	✓	✓	Ventura Math
VU	14J	Part	Part	✓	Ventura US
W1[1]	19U	✓	✓	✓	Windows 3.1 Latin 1
WA	9V	✓	✓	✓	Windows Latin/Arabic
WD	579L	X	X	✓	Wingdings
WE[1]	9E	✓	✓	✓	Windows 3.1 Latin 2
WG[1]	9G	Part	✓	✓	Windows Latin/Greek
WL[1]	19L	✓	✓	✓	Windows 3.1 Baltic (Latv, Lith)
WN	9U	X	X		Windows
WO	9U	✓ [1]	✓ [1]	✓ [1]	Windows 3.0 Latin 1

Code Page Identifier		Font Format			Description
		MicroType		True Type	
Datamax-O'Neil	HP (PCL)	CG Triumvirate	CG Times		
WR[1]	9R	✓ [1]	✓	✓	Windows Latin/Cyrillic
WT[1]	5T	✓	✓	✓	Windows 3.1 Latin 5

[1] Contains the Euro currency symbol (€).

CHAPTER

3

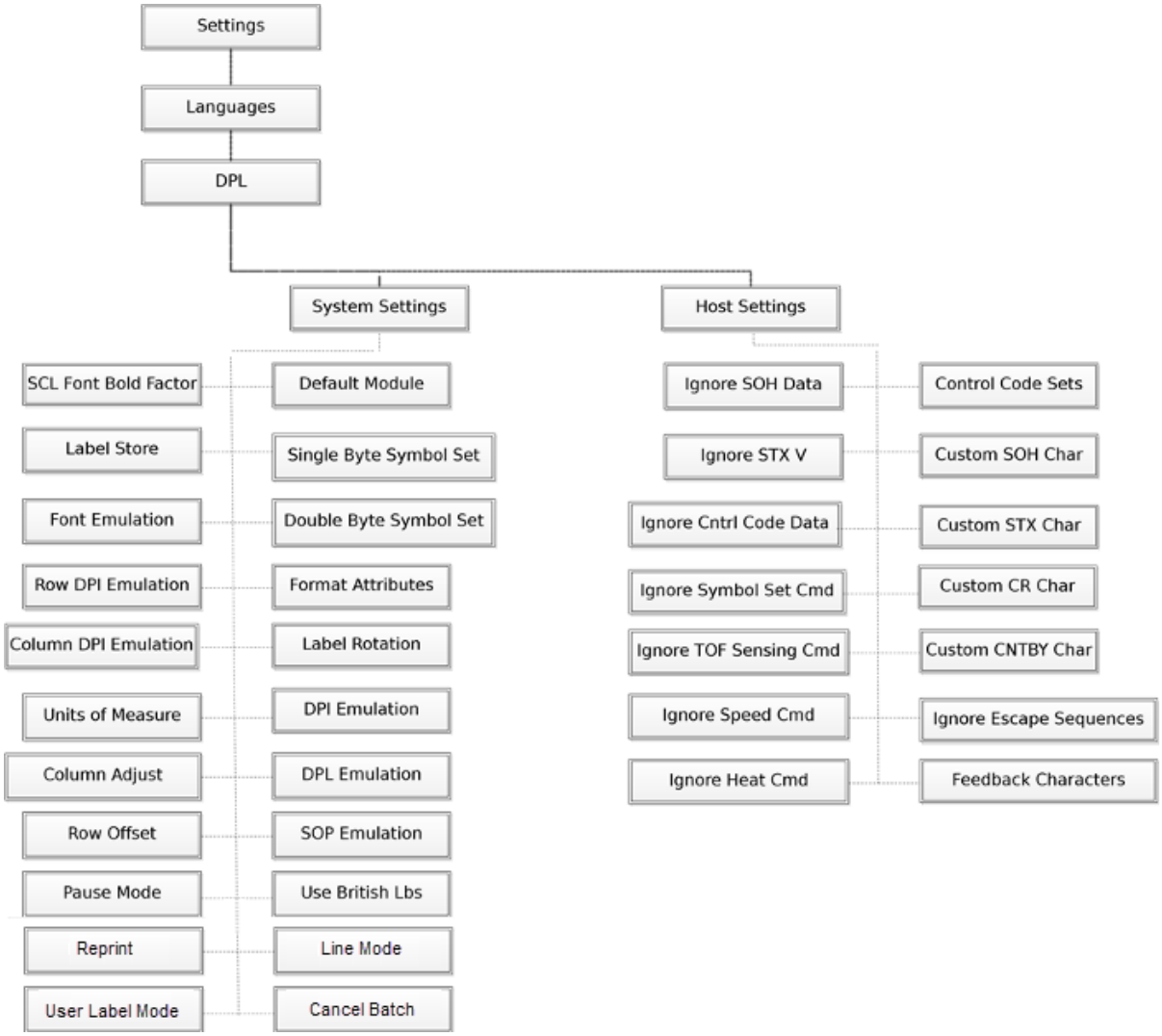
CONFIGURATION

The following configuration commands are supported. Each command is displayed as a table with a "Property" and "Value" column. The "property" shows an attribute of the command and the "value" either contains a value or an explanation. Here is the meaning of each "property" row:

Property	Value
Description	What the command does.
Value	the possible values for the command.
Type	the type of value possible: a list, an integer, a string, etc.
Default	the default value for the command in factory-configured printers.
Access Level	the user access required to change the command. Can be 1="user", 2="admin", or 3="itadmin" Interface and Supported describe the different ways this command can be viewed and/or changed
Web Page	if "yes", this command can be accessed from the printer web page (for network connected printers).
LCD	if "yes", this command can be accessed on the printer's LCD-panel menu system (for printers with a display).
SmartSystems	if "yes", this command can be accessed from Honeywell's SmartSystems device management utility

DPL Configuration Menu

DPL-specific configuration options are accessed from Settings --> Languages --> DPL in the various printer menu systems. Here is a listing of all of the configuration options.



Note: *More configurations can be added in the future.*

Host Settings

Host settings configuration commands change the way DPL responds to the sending host system.

Feedback Characters

Property	Value
Description	Enables or disables the feedback ASCII hex characters.
Value	Disable Enable
Type	List

Property	Value
Default	Disable
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Control Codes

Control code configuration commands change the different control characters used to activate DPL commands.

Custom CNTBY Char

Property	Value
Description	Enter CNTBY control character.
Value	0 - 255 decimal
Type	Numeric
Default	94
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Custom CR Char

Property	Value
Description	Enter CR control character.
Value	0 - 255 decimal
Type	Numeric
Default	13
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Custom SOH Char

Property	Value
Description	Enter SOH control character.
Value	0 - 255 decimal
Type	Numeric
Default	1
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Custom STX Char

Property	Value
Description	Enter STX control character.
Value	0 - 255 decimal
Type	Numeric
Default	2
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Ignore Commands

Ignore commands is a list of DPL commands which, if set to 'On', are ignored (they will not be processed if found in incoming data streams).

Ignore Cntrl Code Data

Property	Value
Description	Ignore Control Code Data.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes

Ignore Escape Sequences

Property	Value
Description	Ignore Escape Sequences.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes

Ignore Heat Cmd

Property	Value
Description	Ignore Heat Command.
Value	On / Off

Property	Value
Type	List
Default	Off
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes

Ignore Present Distance

Property	Value
Description	Ignore Present Distance.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Fingerprint	N/A
Web Page	Yes
LCD	Yes

Ignore SOH Data

Property	Value
Description	Ignore SOH data.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Fingerprint	N/A

Interface	Supported
Web Page	Yes
LCD	Yes

Ignore Stop Location

Property	Value
Description	Ignore Stop Location.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Fingerprint	N/A
Web Page	Yes
LCD	Yes

Ignore STX V

Property	Value
Description	Ignore STX V.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Fingerprint	NA
Web Page	Yes
LCD	Yes

Ignore Speed Cmd

Property	Value
Description	Ignore Speed Command.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes

Ignore Symbol Set Cmd

Property	Value
Description	Ignore Symbol Set Command.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes

Ignore TOF Sensing Cmd

Property	Value
Description	Ignore TOF Sensing Command.
Value	On / Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes

System Settings

System settings affect how DPL reacts to incoming data. Note that these only affect DPL data streams. If the printer is in Language Autosense mode, then print jobs in other printing languages will respect their own system settings, not these DPL-specific settings.

Default Module

Property	Value
Description	Selects default module for storing and recalling in DPL mode.
Value	Module D Module G
Type	List
Default	Module D
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Double Byte Symbol Set

Property	Value
Description	Selects default double byte symbol set for DPL labels.
Value	B5-Big 5 (Taiwan) GB- Chinese (PRC) SJ- Shift JIS UC- Unicode (including Korean)
Type	List

Property	Value
Default	UC
Access Level	1

Interface	Supported
Interface	Supported
Fingerprint	NA
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Note: *Following symbols are not supported on FIJI.*
EU - EUC (Extended UNIX Code)
JS - JIS (Japanese Industry Standard)

Single Byte Symbol Set

Property	Value
Description	Selects default single byte symbol set for DPL labels.

Property	Value
Value	AR - Arabic-8 CP - PC Cyrillic DN - ISO 60 Danish / Norwegian DT - DeskTop E1 - ISO 8859/1 Latin 1 E2 - ISO 8859/2 Latin 2 E5 - ISO 8859/9 Latin 5 E6 - ISO 8859/10 Latin 6 E7 - ISO 8859/7 Latin/Greek E9 - ISO 8859/15 Latin 9 EG - ISO 8859/7 Latin/Greek EH - ISO 8859/8 Latin/Hebrew ER - ISO 8859/5 Latin/Cyrillic FR - ISO 69: French G8 - Greek-8 GK - PC-8 Greek GR - ISO 21: German H0 - Hebrew-7 H8 - Hebrew-8 IT - ISO 15: Italian L$ - HP4000 ITC Zapf Dingbats LG - Legal M8 - Math-8 MC - Macintosh MS - PS Math P9 - PC-858 Multilingual PB - Microsoft Publishing PC - PC-8, Code Page 437 PD - PC-8 D/N, Code Page 437N PE - PC-852 Latin 2 PG - PC-851 Latin/Greek PH - PC-862 Latin/Hebrew PI - Pi Font PM - PC-850 Multilingual PR - PC-864 Latin/Arabic PT - PC-8 TK, Code Page 437T PU - PC-1004 PV - PC-775 Baltic PY - Non-UGL, Generic Pi Font R8 - Roman-8 R9 - Roman-9 SP - ISO 17: Spanish SW - ISO 11: Swedish

Property	Value
	SY - Symbol TS - PS Text U8 - UTF8
	UK - ISO 4: United Kingdom US - ISO 6: ASCII VI - Ventura International VM - Ventura Math VU - Ventura US W1 - Windows 3.1 Latin 1 WA - Windows Latin/Arabic WD - Wingdings WE - Windows 3.1 Latin 2 WG - Windows Latin/Greek WL - Windows 3.1 Baltic (Latv, Lith) WO - Windows 3.0 Latin 1 WR - Windows Latin/Cyrillic WT - Windows 3.1 Latin 5
Type	List
Default	PM
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Format Attributes

Property	Value
Description	Selects default format attributes for DPL labels.
Value	XOR Opaque Transparent
Type	List
Default	XOR
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Label Rotation

Property	Value
Description	Selects default label rotation for DPL labels.
Value	0 deg 90 deg 180 deg 270 deg
Type	List
Default	0 deg
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Label Store

Property	Value
Description	Selects default format of storing DPL labels.
Value	State and Fields Fields only
Type	List
Default	State and Fields
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Units of Measure

Property	Value
Description	Selects default units of measurement.
Value	Imperial Metric
Type	List
Default	Imperial
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Column Adjust

Property	Value
Description	Adjusts starting column position of the label.
Value	-300 to 300
Type	Numeric
Default	0
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Column DPI Emulation

Property	Value
Description	Selects default column position DPI emulation.
Value	153-350
Type	Numeric
Default	203
Access Level	1

Interface	Supported
Fingerprint	NA
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Row DPI Emulation

Property	Value
Description	Selects default row position DPI emulation.
Value	103-400
Type	Numeric
Default	203
Access Level	1

Interface	Supported
Fingerprint	NA
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Row Offset

Property	Value
Description	Sets vertical offset of the image for DPL labels.

Property	Value
Value	0 - 6000
Type	Numeric
Default	0
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Pause Mode

Property	Value
Description	Pause after every label.
Value	On Off
Type	List
Default	Off
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

Use British Lbs

Property	Value
Description	Use symbol for the British Pound.
Value	Disable Enable
Type	List

Property	Value
Default	Disable
Access Level	1

Interface	Supported
Web Page	Yes
LCD	Yes
SmartSystems	Yes

CHAPTER

4

SYSTEM BEHAVIOR

This section describes operational behaviors and differences from Datamax-O'Neil printers.

Configuration Persistence

DPL will use the default Honeywell printer behavior and save configuration values when they are changed.

Summary

Configuration Persistence

Note:

- C_structures - RAM based, persistent during power up session, lost at power down, language unique
- M_structures - RAM based, temporary for active print job, lost with next job, language unique
- RAM database - RAM based, lost at power down, not available in Honeywell, language unique or shared
- NV database - Nonvolatile permanent memory, language unique or shared, power-up configuration

Configuration Kc commands:

- Value written into NV, then loaded into data C_structures at power up or soft reset
- Persistent through power down
- NV database Changes checked and taken into C_structures at job initialization
- Takes effect on any next job for native command immediately (asynchronously)
- Native parameters affected by other languages because they are shared
- Changes are visible in User Interfaces

System STX commands:

- Value goes into C_structures, and into RAM database (Datamax-O'Neil), NV database (Honeywell)
- Persistent during powered up session, lost (Datamax-O'Neil), preserved (Honeywell) at power down
- Effect (if any) takes place immediately, asynchronously
- Native parameters affected by other languages because they are shared
- NV database changes reflected in C_structures at beginning of each job
- C_structures are used to initialize job parameters (M_structures) at beginning of job
- M_structures are modified and used while parsing and rendering
- Changes are visible in User Interfaces

Label Commands– Controls image format, (format spec. commands inside label format)

- Values written into language specific M_structures during parsing of label commands
- Persistent with the label job, lost at next label job initialization
- M_structures affect immediate formatting but physical effect is delayed till printing
- Changes are not visible in User Interfaces

Error Message Behavior

Honeywell/Intermec Printer

System error message behavior shall follow Honeywell/Intermec printer behavior, and handles general media errors similar to the reference DPL printer.

Error messages shall be notified through typical means as with all printers via LED, LCD (UI), printer web page.

Notable difference from reference printer:

1. If the printer is configured for Direct Thermal media, and Ribbon is physically installed, an error message "Ribbon Installed" will be triggered.

Datamax-O'Neil Printer

1. Ribbon Fault: - No Motion detected for configured distance during label print or feed operations and configured for Thermal Transfer mode of operation. No faults reported is in Direct Thermal Operation.
2. TOF Faults: - Printer did not reach the gap or black mark within the configured Maximum label length setting.
3. Out of Media - TOF Sensor detected reading below Paper Out threshold configuration setting during label print or feed operation.

Error Messaging LED's

- Solid Green - Ready
- Flashing Green - Receiving data
- Solid Red - TOF Error
- Flashing Red - Out of Media (Paper or Ribbon)
- Solid Orange - Printer Paused
- Flashing Orange - Printer Label Taken sensor blocked.

Display equipped printers output appropriate corresponding messages.

Font Downloading Behavior

Honeywell/Intermec Printer

Fonts can be downloaded using the respective DPL font download/installation commands

Fonts downloaded via means, other than DPL command, will not be accessible by DPL font IDs.

E.g. Non-DPL command means of installing fonts

- USB menu selection (for printers with LCD).

- Printer web page.

- Via host applications such as PrintSet.

Datamax-O'Neil Printer

DO downloaded fonts require use of a storage location and unique access DPL access ID descriptors to be appended to the beginning of all fonts data to be download. The

label scripts then utilize the ID along with access method to utilize the fonts. DO printers do not support copying raw files directly. All saved data is parsed through the host port access and labeled accordingly.

Head Closure / Power Up Behavior

Printer shall adapt Honeywell printer native behavior regardless if it is in DPL Language mode or not.

Internal Drive Mapping

The drive mapping below applies to all DPL commands that store files in printer.

DPL Drive	IN Path	Notes
G:	/home/user	Persistent storage
X:	/home/user	Persistent storage
Y:	/home/user	Persistent storage
D:	/tmp	Volatile storage, cleared upon power cycle
H:	/media/sda1	USB memory

Label Length Behavior

Terminology used here:

- Label Length - specified by <stx>KcCL, or overridden by <stx>c command.
- Image Length - imaged area of the label (includes top/ bottom margins)
- Print Length - physical label length (motion length excluding stop distance)

Continuous Paper:

1. Fixed Length:

   1A. If image length is smaller or equal than label length specified, then Honeywell print is the same as Datamax-O'Neil print.

   1B. If image length is longer than label length specified then in Phase1, there will be the following difference:

   - Datamax-O'Neil prints the entire image and fills in white space up to the nearest multiple of label length. (Ex: image length 5", label length 3", print length 6" with 1" white space)
   - Honeywell clips label at 3". User required to set label length to 6" to get same result as Datamax-O'Neil.

Note: Instruct Honeywell DPL user to set the desired print length as specified label length.

2. Variable Length:

   2A. If image length is larger or equal than label length specified:

   - Datamax-O'Neil expects the label length to be set to 1 (or less than 20) to produce variable length label equal to image size.
     (Datamax-O'Neil: If the label length specified is larger than 20, then print will be as in 1B)
   - Honeywell (in continuous variable mode) will truncate print at label length.

   2B. If image length is smaller than label size:

   - Datamax-O'Neil: The print will be the same as 1A
   - Honeywell: (in continuous variable mode) The print will be the length of the image.

Note: Instruct Honeywell DPL user to set database label length to be larger than the actual image size, then leave Datamax-O'Neil script label length set to 1 when printing the label.

Gap/Mark Paper:

- Honeywell truncates image according to Label Length but Datamax-O'Neil printers do not. Datamax-O'Neil user needs to make sure Label Length does not constrain the print length.
- Honeywell and Datamax-O'Neil print the same over gaps. "Clip" is Honeywell terminology for Datamax-O'Neil TOF Precedence or truncation.

Large Barcode Printing Behavior

Very large barcodes will not print if they exceed available memory. This typically occurs when using height and width multipliers in the "A-Z" or "a -z" range. In most cases, these barcodes would print outside the label boundary anyway so they would not be scannable if printed.

Label Width Behavior

KcLW write command will allow minimum ¾" width and maximum to print head width.

LW read will not check minimum but limit maximum to print head width.

KcQQQ will return database value up to print head width.

Label width can be set via menu but Honeywell printers have a minimum width below which the printer will not print.

Pause / Cancel Label behavior

Honeywell/Intermec Printer

Printers in DPL language mode shall behave similar to reference DPL printers in the behavior of Pause and Cancel operations.

Datamax-O'Neil Printer - Pause

If the user pauses while printing, the current label being printed shall complete before the printing pauses.

A printer in paused state shall resume from last operational state prior to being paused.

If the printer has jobs to be printed, the UI will prompt for Cancel or Resume; for non display, resume from paused state; or for non-display printers, if button depression for 5 seconds or more, will automatically cancel the current batch of label and proceed to the ready state if not faulted.

Non display printer operation

Can be invoked by sent via host interface DPL immediate command or UI button press.

1. If Printer is Idle: Printer will be put into paused state; No printing or print operations will be enabled.
2. If Printer is Paused, Printer go to Ready / Idle state and commence print operation if print jobs were interrupted
3. If printer is Paused and print jobs suspended via pause operations if UI button is depressed for 3 seconds, the current label or batch of labels are purged.

Display printer operation

Can be invoked by sent via host interface DPL immediate command or UI button press.

1. If printer is Idle: Printer will be put into paused state; No printing or print operations will be enabled.
2. If Printer is Paused, Printer go to Ready / Idle state and commence print operation if print jobs were interrupted

Datamax-O'Neil Printer - Cancel

Cancel request received in the Paused state will purge any label jobs in the current batch and enter the ready state. No additional labels shall be printed.

Cancel request received (via immediate command) in the idle state will place the printer into the paused state.

Cancel request received while printing will pause the printer, same as pause, and purge any label in the current label batch. No additional labels shall be printed from the current batch when the printer resumes operation via the pause mode functionality described above.

Printer Restart Behavior

Printer needs a restart only on specific Kc commands as indicated in command specification.

Webpages will require reset for parameters corresponding to Kc commands that require reset.

Stop Location Behavior

T – sets print mode to TEAR, leaves present distance (rest adjust) alone.

- KcQQQ returns SLT

A – leaves print mode alone, sets present distance (rest adjust) to AUTO (zero)

- KcQQQ returns SLA (if still in present distance Auto)
- H, C, P, N are ignored

CHAPTER

5

LINE MODE

A generic feature in DPL to print dynamic data

Create Label Template

Save label template with save format command.

Command Format:

s[Module][template]

where:

[Module]: Module to save to. Module must be: G

[template]: Name of template to save. Name must be: DMXFRM

Save multiple label templates.

Command Format:

s[Module][template][id]

where:

[Module]: Module to save to. Module must be: G

[template]: Name of template to save. Name must be: DMXFRM

[id]: 2 alphanumeric characters. Example: A1, A2, 11, 10, AA, AB, etc.

Variable Data Field

Variable data field in template receives dynamic data during print.

To declare a variable data field, add 'U' after the field.

Example

191100002300350Sample Data

U

This makes field "191100002300350Sample Data" to receive dynamic data for printing.

Enable Disable Line Mode

Enable / Disable Line Mode

<STX>KcEM1 Enable Line Mode

<STX>KcEM0 Disable Line Mode

Raw Data Input Format

The data that can be processed by DPL when line mode is enabled.

Raw data input under line mode.

Example

Test data

Test data

This supplies two text input and fill in the first two variable data fields in label template: DMXFRM.

Raw data input for multiple templates.

Example (RAW ASCII Data for template 01)

01>I-Class / I-4212

01>R22-00-14000Y07

01>30277592

01>I4212/30277592

This supplies 4 text input and fill in the first 4 variable data fields in label template: DMXFRM01.

Example (RAW ASCII Data for template 02)

02>I-Class / I-4212

02>R22-00-14000Y07

02>30277592

02>I4212/30277592

This supplies 4 text input and fill in the first 4 variable data fields in label template: DMXFRM02.

The printer waits for all input data to be provided before printing the label. A newline is necessary to proceed to the next variable data.

Communication Interface

Supports all printer standard communication interfaces except USB Keyboard and USB Scanner.

Internal Variable Replacement IVR

This is enhanced Line Mode feature on printer with LCD display.

Specially designed label formats will be stored in printer and be able to select that label format on the front panel.

The label format may contain fixed text/barcodes as well as variable information provided by a keyboard or scanner.

Only printer resident fonts and barcodes are allowed. Graphics are not allowed.

UI Menu

This is the UI to display DPL format template on printer. User can select the format to print from this menu.

It is only available on printer with LCD display.

Menu Path on LCD

Programs - DPL Label Formats

User Label Mode

By enabling "User Label Mode", printer displays list of DPL format template after boot-up.

Menu Path on LCD / web interface

Configure - Languages - DPL - User Label Mode.

Parameter: Enable / Disable.

Create Label Template

Save label template with save format command.

Command Format:

s[Module][template]

where:

[Module]: Module to save to. Option: G

[template]: Name of template to save. Valid name: Max 16 characters

Example

sGMyFormat01

This creates template "MyFormat01".

Variable Data Field

For fields requiring variable information, replace static data with &Prompt&.

Example:

191100305570008&ENTER COMPANY NAME&

This declares a field to receive "company name" for printing.

Communication Interface

Supports USB HID devices. For, example, USB keyboard and USB Scanner.

Supports all printer standard communication interfaces.

Data Error Handling

There is no validation of data. It just prints whatever received.

For printing errors, e.g. media out, it follows DPL system error handling logic.

UI Interface

LCD Display

Printer uses two lines display. 1st line for prompt, 2nd line for user input data.

Max number of characters per line is limited to 16.

Keypad

Support ENTER and CANCEL key.

ENTER: go to next variable field

CANCEL: quit IVR mode. Use "C" key on PM43/42. Use BACK key on PC43/42.

Behavior

IVR format can only be loaded manually from printer LCD interface.

User must input all required data from the supported interface to print a label.

After one label is printed, the same IVR format is reloaded automatically for subsequent print.

Use cancel button to quit IVR, otherwise the same IVR format is reloaded.

CHAPTER

6

COMMANDS NOT SUPPORTED

Some commands in Datamax-O'Neil DPL will not be supported in this version of DPL. The non-supported commands are listed here, by section.

Immediate Commands Not Supported

The following Immediate (<SOH>) commands will not be supported:

Commands	Description
SOH D	SOH Shutdown
SOH S	Set Printer State
SOH U	Reset
SOH v	Send Internal Build String

System Level Commands Not Supported

The following system commands will not be supported:

Commands	Description
STX c	Set Continuous Paper Length Modulus Support
STX M	Set Maximum Label Length
STX P	Set Hex Dump Mode
STX R	Ribbon Saver Control
STX Y	Output Sensor Values
STX:	Dump RAM configuration to host. DEBUG must be defined.
STX z	Pack Module

Extended System Commands Not Supported

The following extended system commands will not be supported:

Commands	Description
STX K}E	Empty Sensor Calibration
STX K}M	Manual Media Calibration
STX K}Q	Quick Media Calibration
STX KaR	Read Data from RFID Tag
STX KaW	Write Data to RFID Tag
STX Kb	Backfeed Time Delay
STX KF	Select Factory Default
STX Kp	Module Protection
STX Ky	Download Plug-In File
STX KD	Database Configuration
STX Kd	Set File as Factory Default
STX KH	Dot Check
STX KI	GPIO Input
STX Kn	NIC Request
STX KO	GPIO Output
STX KtA	Write Application Family Identifier (AFI) to Tag
STX KtD	Write Data Storage Format Identifier (DSFID) to Tag
STX KtE	Write Electronic Article Surveillance (EAS) Bit
STX KtH	Read and Feedback Tag INformation to Host
STX KtR	Read Data from RFID Tag
STX KtU	Read Unique Serial Number from RFID Tag
STX KtW	Write Data to RFID Tag
STX KuB	Read Data from Gen2 Tag Selection
STX KuF	Send RFID Device Firmware Version
STX KuJ	Write Data to Gen 2 Tag Selection
STX KuR	Read Data from RFID Tag
STX KuW	Write Data to RFID Tag
STX KV	Verifier Enable/Disable

Configuration Commands Not Supported

The following configuration set commands (<STX>Kc) will not be supported:

Commands	Description
STX KcA1	BOOT 1 Architecture (DO CEE Platform Only)
STX KcA2	BOOT 2 Architecture (DO CEE Platform Only)
STX KcA3	Firmware Architecture (DO CEE Platform Only)
STX KcAT	Auto Input Toggle Mode
STX KcBS	Backup Speed
STX KcEV	Enpty Sensor Level
STX KcFC	Wi-Fi FCC Testing (compile flag)
STX KcFS	Slew Speed (Uses Feed Speed - Fiji)
STX KcGD	Display Mode
STX KcGL	Gap Sensor Location (MP Compact Only)
STX KcGM	Gap/Mark Value
STX KcGR	Gain Reflective Value
STX KcGS	GPIO Slew
STX KcIE	Ignore Distance (no longer supported -DO)
STX KcML	Max Label Length (Fixed 1.5* Cont length - Fiji)
STX KcMV	Mark Value
STX KcPH	Parse LAH
STX KcPJ	Present Adjust Fine Tune - (Printer Mech Adjust)
STX KcPO	Paper Empty
STX KcPV	Paper Value
STX KcRV	Reflective Paper Value
STX KcSA	SA SOP Adjust (no longer supported - DO)
STX KcSB	Smart Battery
STX KcSC	Scalable Font Cache
STX KcSG	Sensor Gain Value
STX KcWP	Windows driver for EZ Emulation
STX KcXX	Printer Information
STX KcXY	RetaPil Initiative

Commands	Description
STX KcXZ	Retail Initiative
STX KcZR	Wi-Fi Radio Power State
STX KcFE	Font Emulation
STX KcFB	Scalable Font Bolding
STX KcNR	No Reprint
STX KcOF	Option Feedback
STX KcSA	SOP Adjust
STX KcAW	Airwatch
STX KcBA	Backup After Print
STX KcBC	Batch Cancel
STX KcBL	Backup Label
STX KcBS	Backup (Reverse Speed)
STX KcBZ	Buzzer Enable
STX KcCU	Configuration Builder
STX KcCP	Center Print
STX KcDE	DPI Emulation
STX KcDR	Delay Rate
STX KcEP	End of Print
STX KcEQ	Start of Print
STX KcGE	GPIO Equipped
STX KcGP	GPIO Error Pause
STX KcGS	GPIO Slew
STX KcHT	Host Timeout
STX KcIE	Ignore Distance
STX KcIL	Image Mode
STX KcLA	Label Alignment
STX KcLE	Legacy Emulation
STX KcMCC	Module Command
STX KcML	Maximum Length - Distance printer moves paper before detecting TOF fault

Commands	Description
STX KcMM	Menu Mode
STX KcPG	Present Delay
STX KcPJ	Present Adjust Fine Tune
STX KcPP	Parallel Direction
STX KcPW	Password Set
STX KcRR	Rewinder Adjust
STX KcRI	RFID
STX KcRI	Reprint Last
STX KcRP	Ribbon Low Pause
STX KcRS	Ribbon Low Signal
STX KcSS	sS Feed Speed
STX KcSV	STX-v
STX KcUD	User Label Mode
STX KcUT	User Terminator

Label Formatting Commands Not Supported

The following extended system commands will not be supported:

Commands	Description
S	Set Feed Speed
p	Set Backfeed Speed
Format Record Command	Fill Patterns

Symbol Sets Not Supported

Commands	Description
D1	11L - ITC Zapf Dingbats/100
D2	12L - ITC Zapf Dingbats/200
D3	13L - ITC Zapf Dingbats/300
DS	10L - PS ITC Zapf Dingbats
PX	12U - PTXT3000

Commands	Description
TK	8T - Turkish-8
WN	9U - Windows
EU - Double Byte Encoding	Ö - EUC (Extended UNIX Code)
JS - Double Byte Encoding	Ö - JIS (Japanese Industry Standard); default

Scalable Fonts Not Supported

Scalable Font K1: Gothic E Kanji (Downloaded / Embedded)

Gothic E Kanji: Double Byte Scalable Font ID UK1 Binary / uK1 Hex Ascii. This font is downloaded via dpl plugin. Available upon request from users.

CHAPTER

7

REFERENCE INFORMATION

Speed Ranges

Printer Speed Command*	Speed Value:	
	Inches per Second	Millimeters per Second
A	1.0	25
B	1.5	38
C	2.0	51
D	2.5	63
E	3.0	76
F	3.5	89
G	4.0	102
H	4.5	114
I	5.0	127
J	5.5	140
K	6.0	152
L	6.5	165
M	7.0	178
N	7.5	191
O	8.0	203
P	8.5	216
Q	9.0	227
R	9.5	241
S	10.0	254
T	10.5	267
U	11.0	279
V	11.5	292
W	12.0	305
X	13.0	330
Y	14.0	356
Z	15.0	381
a	16.0	406

Printer Speed Command*	Speed Value:	
	Inches per Second	Millimeters per Second
b	17.0	432
c	18.0	457
d	19.0	483
e	20.0	508

*Applicable speed values are printer dependent. See the table below.

Model	Print Speed		Feed Speed		Reverse Speed		Slew Speed	
	Range	Default	Range	Default	Range	Default	Range	Default
PC42t/d	2-4ips	4ips	2-4ips	4ips	N/A	4ips	N/A	N/A
PC42d 6/8ips	2-8ips	6ips	2-8ips	6ips	N/A	4ips	N/A	N/A
PC42tp	2-5ips	4ips	2-5ips	4ips	N/A	4ips	N/A	N/A
OT800/OD800	2-4ips	4ips	2-4ips	4ips	N/A	4ips	N/A	N/A
PC43t/d	2-6ips	4ips	2-8ips	4ips	N/A	2ips	N/A	N/A
PM43	4-12ips	4ips	4-12ips	4ips	N/A	12ips	N/A	N/A
PM42	4-12ips	4ips	4-12ips	4ips	N/A	4ips	N/A	N/A
PD43	2-6ips	4ips	2-8ips	4ips	N/A	2ips	N/A	N/A

PX940A	Print and Feed Speed		Reverse Speed	
	Range	Default	Range	If > 6 ips
203 dpi	50 to 350 mm/sec (2 to 14 ips)	100 mm/s (4ips)	2-6	6
300 dpi	50 to 300 mm/sec (2 to 12 ips)	100 mm/s (4ips)	2-6	6
600 dpi	25 to 150 mm/sec (1 to 6 ips)	50 mm/s (2ips)	1-6	6
900 dpi	25 to 100 mm/sec (1 to 4 ips)	50 mm/s (2ips)	1-4	4
1200 dpi	25 to 100 mm/sec (1 to 4 ips)	50 mm/s (2ips)	1-4	4

PX940V	Print and Feed Speed		Reverse Speed	
	Range	Default	Range	If > 6 ips
203 dpi	50 to 200 mm/sec (2 to 8ips)	100 mm/s (4ips)	2-6	6
300 dpi	50 to 200 mm/sec (2 to 8 ips)	100 mm/s (4ips)	2-6	6
600 dpi	25 to 150 mm/sec (1 to 6 ips)	50 mm/s (2ips)	1-6	6

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