

Print Head Specifications:

Horizontal resolution: 300dpi

Vertical resolution: 300dpi (1/2 inch print swath)

Line speed maximum: 200 ft/min

Daisy Chain: 8 Cartridges (eight 1/2", four 1" heads, or any combination totaling 8 cartridges)

Connection:

Serial port settings to connect to the print head are 57600,8,n,1 no flow control.

Command structure:

Print head commands are structured as follows: head address (head address is 0 indexed), then the command followed by a carriage return (0x0d) or a line feed (0x0a). For example, to set the horizontal field position of the first head in the daisy chain at 50 columns the command would be:

```
0h0050↵
```

Characters sent to the head are echoed back on the serial port as they are sent, with the exception of the head address. The head address is echoed back upon reception of the first character of the command. If a character is not echoed within one second then the head has not received it. When the head receives a CR (0x0d) or a LF (0x0a) it will respond with a CRLF (0x0d0a). If the command is a request for information, then the response will follow. Command length, excluding the head address, should not exceed 52 characters.

A note about print head addresses: A 1" print head occupies two consecutive print head addresses, with the top half of the head always having the lower number address of the pair.

A complete example of setting up a print message:

This:

```
0z↵  
0fTArial_150,Test↵  
0h390↵  
0v0↵  
0fTArial_75,Hello↵  
0h390↵  
0v75↵  
0fTArial_75,World↵  
0a675↵
```

Prints this:



Printer Commands:

tMMDDhhmmYY – **Calendar** set, to set the time and date of the print head's internal clock. Both time and date must be set in a single command. Setting the clock sets the seconds to 0.

MM - Month (01-12)
DD - Day (01-31)
hh - Hour (00-23)
mm - Minute (00-59)
YY - Year (00-70)

rtHHMM – Set **rollover time**. Rollover time is the time that printed day and date codes “rollover” from one day to the next. It is set using a 24 hour format; the default rollover time is 00:00 (midnight).

Example:

```
0rt2330↵          Set rollover time to 23:30.
```

hDDDDD – Set **horizontal** field position (indent) in columns; 300 columns = 1 inch.

DDDDD = value (0-32767)

vDDDD – Set **vertical** field position in dots; 0 is the top dot.

DDDD = value (0-149)

uD – Print **upside down** command.

D = 0, print right side up.

D = 1, print upside down.

The upside down command acts like a switch: all fields received between a 'u1' command and a 'u0' command will print upside down. The Clear command (see 'z' command below), forces right side up print.

aDDDDD – Set **message length** in columns; 300 columns = 1 inch.

DDDDD = value (0-32767)

z – **Clears** the print message buffer; sets the horizontal field position, vertical field position, and message length to 0; forces right side up print; restores default bar code properties.

cD[,NNNNNN] – **Continuous** print.

D = 0, non-continuous print (default); prints once each time the photocell is blocked.

D = 1, continuous print; message prints repeatedly as long as the photocell is blocked.

NNNNNN = optional, print NNNNNN number of times before canceling. For example c0,10 would print 10 times before cancelling.

i – **Print trigger** Trigger a print. The print trigger command functions only when the print direction is set to 'l' or 'r' (see the 'pdD' command), and the print head is configured for fixed print speed (see the 'psDDD' command) or external encoder (see the 'peD' command).

pu – **Purge** the print head.

Example of purging the first print head:

```
0pu↵
```

wDDD – Set horizontal character width percentage; default is 100

DDD = value (25-600); accepted values: 25, 33, 50, 66, 75, 100, 150, 200, 300, 400, 500, 600

pdD – Set **Print direction** of the print head, where

D = l (lower case 'L'), package travels left to right past the print head (default).

D = r, package travels right to left past the print head.

D = 0 (zero), print direction is automatically detected by the print head's internal photocells.

A setting of 'l' or 'r' requires the print head be configured for fixed print speed (see the 'psDDD' command) or external encoder (see the 'peD' command).

psDDD – Set the print head's **print speed**, in feet per minute.

DDD = value (000-200)

A setting of 0 tells the print head to automatically determine the print speed using its two internal photocells. The print speed setting is ignored when the print head is configured for external encoder (see the 'peD' command).

poDDDDD – Set the **photocell offset** in columns; 300 columns = 1 inch. The photocell offset is the distance from the center of the photocell to the center of the print head.

DDDDD = value (0-32767)

ppD – **Pause** print command.

D = 0, normal print head operation.

D = 1, print is paused (photocell trips are ignored) at the end of the current print cycle.

pfD – **External Photocell** command. See the **Connector Pinout** section for physical connections and signal specifications.

D = 0, print is triggered by the print head's internal photocells (default).

D = 1, print is triggered by an external photocell or other device.

peD – **External Encoder** command. See the **Connector Pinout** section for physical connections and signal specifications.

D = 0, print speed is determined by the print head's internal encoder (default).

D = 1, print speed is determined by an external 300 dpi encoder.

pbD – **Bulk Ink** command.

D = 0, tells the print head that it is operating with a regular print cartridge.

D = 1, tells the print head that it is operating with a bulk ink system fed print cartridge.

paD – **Alternate Banks** command

D = 0, tells the print head not to alternate print banks

D = 1, tells the print head to alternate print banks (default)

pcDDD – Calibration command, 1” print head only. The calibration command vertically aligns the print for the top and bottom print cartridges on a 1” print head. Misalignment is most noticeable when printing with the Arial_300 (1”) font, or when printing logos taller than 1/2” (see illustration below).

DDD = calibration value (310-350).

The calibration value is factory set, and normally does not need to be adjusted by the user.



ptD – Trailing print head command, 1” print head only.

D = 0, indicates the leading print head, the one seen first by a passing product.

D = 1, indicates the trailing print head.

D should always be 0 for a 1/2” print head.

Pcmd – Broadcast command, sends a command to all print heads in the daisy chain simultaneously. cmd = the command to be sent. The print head address in the command is the address of the last print head in the daisy chain. Examples:

P1pp1 – pause print on all print heads in a two head daisy chain.

P3ps60 – set the print speed of all print heads in a 4 head daisy chain to 60 ft/min.

The broadcast command does not operate with the status (ss), print buffer (sb), or list files (sf) commands.

ss – Status command.

example:

```
0ss↵
v:6.3.1006240810
i:gp
f:o
e:00
s:0
t062811131042
rt2330
ps0
pd0
pf0
pe0
pp0
pc0
pc330
pt0
```

ss – Status command description (continued).

Description:

v: 6.3.1006240810
i:gp

f:o
e:00
t062811131042

Print head **Firmware version** number

Ink Status: 1 to 3 characters

1st char: g = good, l = low, o = out, ? = status unavailable/error

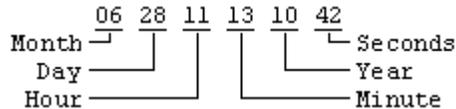
2nd char: p = porous ink, n = nonporous ink.

3rd char: b = bulk ink cartridge, none = regular cartridge

Photocell Status: o = off, l = left, r = right, b = both, e = external

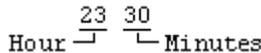
Error Code, factory use only.

Time and date, formatted as follows:



This is the same format as in the Calendar command, with the addition of the seconds.

Rollover time, formatted as follows:



rt2330

ps0
pd0
pf0
pe0
pp0
po0
pc330
pt0
pal

Print speed, see the 'psDDD' command for format

Print direction, see 'pdD' command for format

Photocell, see the 'pfD' command for format

Encoder, see the 'peD' command for format

Pause, see the 'ppD' command for format

Photocell offset, see the 'poDDDDD' command for format

Calibration, see the 'pcDDD' command for format and details.

Trailing print head, see the 'ptD' command for format and details.

Alternate print banks

sf – List files command, lists all fonts and logos currently resident on the print head.

Example:

```
0sf ↵
  Arial_30
  Arial_75
  Arial_150
  Arial_300
  CompanyLogoLg
  CompanyLogoSm
```

rm <filename> – Remove file command, removes (deletes) the font or logo file specified by <filename> from the print head. The command format is 'rm', followed by a space, followed by the file name.

Examples:

```
0rm CompanyLogoLg ↵
0rm Arial_300 ↵
```

rc D xxxx – Reset count in print buffer

D = *, all counts reset to the value provided

0-9, reset a specific count

xxxx = value to reset the count to

sb – Dump print buffer contents command. The end of the print buffer is indicated by a blank line.

example:

```
0sb↵
h0000
v0000
u0
fTArial_150,ITW
h0330
v0000
u0
fTArial_75,TJ
h0330
v0075
u0
fTArial_75,500
a0500
c0
a0900
```

Description:

h0000	Field #1 horizontal position.
v0000	Field #1 vertical position.
u0	Print field right side up.
fTArial_150,ITW	Field #1 – text field, Arial_150 font, text = "ITW"
h0330	Field #2 horizontal position.
v0000	Field #2 vertical position.
u0	Print field right side up.
fTArial_75,TJ	Field #2 – text field, Arial_75 font, text = "TJ"
h0330	Field #3 horizontal position.
v0075	Field #3 vertical position.
u0	Print field right side up.
fTArial_75,500	Field#3 – text field, Arial_75 font, text = "500"
c0	Continuous print is off.
a0900	Product length, 900 print columns (3.00 inches).

Print Field Commands

All print field commands begin with a lower case 'f'. All fields except bar code and logo fields may be printed with the following fonts:

<u>Font Name</u>	<u>Description</u>
Arial_30	Arial font, 30 dots (1/10") high.
Arial_75	Arial font, 75 dots (1/4") high.
Arial_150	Arial font, 150 dots (1/2") high.
Arial_225	Arial font, 225 dots (3/4") high.
Arial_300	Arial font, 300 dots (1") high.

fTxxxx,sssssssssss – Text field, prints simple text.

xxxxx = Font name (see list above).

sssssssssss = text to be printed, maximum 52 characters

Example: fTArial_75,ACME ICE CREAM NOVELTIES

Sequence (Count) Field

There are two sequence field command formats, short and long. The short format command is compatible with all versions of print head firmware. The long format command is compatible only with print head firmware versions 7.5 or later.

With either format, a count's value is incremented when the photocell is tripped initiating a print cycle. This means two things when interfacing directly to a print head:

1. The count value initially sent to the print head must be one less than the desired starting count.
2. The count value returned in a print buffer dump (see the 'sb' command) is the last count printed.

The **short format** sequence command prints a simple incrementing numeric count. Its format is:

fSxxxxx,ddddddddd where

xxxxx = Font name (see list on page 6).

ddddddddd = first number in the count to be printed - 1. Counts may be up to 9 digits long, and must include leading zeros as the number of digits in the command specifies the number of digits in the count.

The print count can begin at any value except zero, but when it rolls over it goes from all 9s to 1. It is not possible to print a count of zero with the short format command.

Examples: fSarial_75,000000 prints a six digit count starting at 000001.
 fSarial_75,999999 also prints a six digit count starting at 000001.
 fSarial_75,0999 prints a 4 digit count starting at 1000.

The **long format** sequence command can print incrementing or decrementing product and pallet counts, counting with number or letters, in increments from 1 to 9999, and with or without leading zeros. The long command format is:

fSxxxxx,sssssssss,SSSSSSSS,z,iiii,pppp,cccc,ddddddddd where

xxxxx = Font name (see list on page 6).

sssssssss = Starting count value, 1-9 digits for numeric counts, 1-7 digits for alpha counts. When the count rolls over it rolls over to the starting count value.

SSSSSSSSS = Stopping count value, 1-9 digits for numeric counts, 1-7 digits for alpha counts.

When SSSSSSSSS > sssssssss the count is an incrementing count. When an incrementing count exceeds the stopping count value it resets to the starting count value.

When SSSSSSSSS < sssssssss the count is a decrementing count. When a decrementing count dips below the stopping count value it resets to the starting count value.

z = Leading zeros flag; 1 = print leading zeros, 0 = do not print leading zeros.

iiii = Print-to-print count increment or decrement, 1-4 digits.

pppp = Items per pallet, 1-4 digits. When 0 the count is a product count, when other than 0 the count is a pallet count, and the value pppp is the number of items per pallet.

cccc = Pallet item count, 1-4 digits, normally begins at 0. When a count is defined as a pallet count, that is, pppp is non-zero, this value is incremented at the beginning of every print cycle. When it exceeds pppp it is reset to 1 and the print count (ddddddddd, below) is incremented/decremented by iiiii.

ddddddddd = This is the actual count printed, and its initial value depends on the type of count being printed. When printing a normal incrementing or decrementing count that begins at the starting count value, make this value equal to the stopping count value. If the count begins

between the start and stop values, make it the desired value plus or minus the *iiii* value. For pallet counts it should be set equal to the desired starting value.

- Notes:**
1. *ssssssss*, *SSSSSSSS*, and *dddddddd* must always have the same number of digits or characters.
 2. To print an alpha count, that is, with letters instead of numbers, *ssssssss*, *SSSSSSSS*, *dddddddd*, and *iiii* are specified using letters. Explanations and examples are below.
 3. When not printing leading zeros, space characters take the place of zeros in *ssssssss*, *SSSSSSSS*, and *dddddddd*.
 4. *pppp* and *cccc* are always numbers, and must have the same number of digits.
 5. All fields in the command must contain data, even if only a '0' (zero).
 6. Not following the above will cause undefined operation.

Examples:

1. A five digit count which begins at 1, counts to 99,999, prints leading zeros, and increments by 1:

```
fSArial_75,00001,99999,1,1,0,0,99999
```

2. A five digit count which begins at 5, counts to 25,000, does not print leading zeros, and increments by 5. Note the 4 spaces before the 5 in the starting value, which gives the start count, stop count, and print count 5 characters each.

```
fSArial_75,    5,25000,0,5,0,0,25000
```

A print buffer dump a few prints after print starts would return:

```
fSArial_75,    5,25000,0,5,0,0,  15
```

3. A six digit count that counts down from 500,000 to 1 and prints leading zeros:

```
fSArial_75,500000,000001,1,1,0,0,000001
```

4. A four digit incrementing pallet count, 50 items per pallet. Note that the pallet item count is initially set to 00, and the print count to the desired starting value:

```
fSArial_75,0001,9999,1,1,50,00,0001
```

The next two are examples of alpha counts. There are two alpha count formats, one for printing a count with leading zeros, and one for printing a count without leading zeros. The formats are based on what is expected of the count for each format.

- When printing leading zeros, A = 0 by definition, so B = 1, C = 2, etc. The counting sequence is AAB, AAC, AAD, ..., AAY, AAZ, ABA, ABB, ABC, ...
 - When printing without leading zeros, A = 1, B = 2, C = 3, etc. The counting sequence is A, B, C, ..., X, Y, Z, AA, AB, AC, ...
5. A three digit incrementing alpha count, with leading zeros, that prints from B to ZZZ, and increments by 1 (equivalent decimal count is 00001 – 17575):

```
fSArial_75,AAB,ZZZ,1,B,0,0,ZZZ
```

6. A three digit incrementing alpha count, without leading zeros, that prints from A to YYY, and increments by 1 (again, equivalent decimal count is 1 – 17,575):

```
fSArial_75,  A,YYY,0,A,0,0,YYY
```

fCxxxxx,DDDD,(format) – Calendar field, short command format; prints a date/time code.

xxxxx = Font name (see list on page 6).

DDDD = Date offset, optional, default value is 0. The date offset is added to the base date to determine the actual date printed. The base date is specified by adding a prefix to the offset:

No prefix: the base date is the current date.

Prefix = w: the base date is the date of the most recent Monday. (Set the offset to zero to print a “week of” code.)

Prefix = f: the base date is the date of the first day of the current fortnight. Fortnights are calculated from a starting date of Saturday, Jan. 1, 2000.

The offset can be specified in either days or months as determined by a suffix:

No suffix, or suffix = D: the offset is specified in days, using 1-4 digits, maximum value is 9999.

Suffix = M: The offset is specified in months, using 1-3 digits, maximum value is 300.

Format characters can be any of the following, used in any combination or sequence:

JJJ = day of the year (001-366)

MM = 2-digit month (01-12)

MON = Month (JAN-DEC)

DD = Day of month (01-31)

Y = 1-digit year (0-9)

YY = 2-digit year (00-70)

YYYY = 4-digit year (2000-2070)

hh = Hour (00-23)

mm = Minutes (00-59)

ss = Seconds (00-59)

Any characters not included above, when included as part of the format, will print ‘as is’ in the position they appear at in the format string. For example, assuming the current date is June 30, 2010, the following calendar field commands will produce the print shown.

fCArial_150,0000,MM/DD/YY will print as 06/30/10.

fCArial_150,MM/DD/YY will also print as 06/30/10.

fCArial_150,0001,MM/DD/YY will print as 07/01/10.

fCArial_150,w001M,MM/DD/YY will print as 07/07/10. (June 10, 2010 is a Thursday. The most recent Monday is June 7. June 7 plus 1 month is July 7.)

fCxxxxx,DDDD,%w,t,ss,o,SS,T, – **Calendar field**, long command format. Use the long command format to print custom and alpha date/time codes that are sequential, periodic (a shift code, for example), or defined in a lookup table. The components in the long command format are:

xxxxx = Font name (see list on page 6).

DDDD = Date offset, optional, default value is 0. The date offset is added to the base date to determine the actual date printed. The base date is specified by adding a prefix to the offset:

No prefix: the base date is the current date.

Prefix = w: the base date is the date of the most recent Monday. (Set the offset to zero to print a “week of” code.)

Prefix = f: the base date is the date of the first day of the current fortnight. Fortnights are calculated from a starting date of Saturday, Jan. 1, 2000.

The offset can be specified in either days or months as determined by a suffix:

No suffix, or suffix = D: the offset is specified in days, using 1-4 digits, maximum value is 9999.

Suffix = M: The offset is specified in months, using 1-3 digits, maximum value is 300.

%w = The number of characters, or **width**, in the printed code. The ‘%’ character is required, i.e. %2.

t = The **type** of code printed – hour, minute, day, month, etc. The code types and their ranges are:

m = minute, 00-59

q = quarter hour, 00-95

h = hour, 00-23

D = day of week, 0-6 (0 = Sunday)

d = day of month, 01-31

w = week of year, 01-53

M = month, 01-12

y = year, 00-99

ss = Sequence **size**, specifies the number of items in a sequential code.

o = Optional **offset** value to add before performing code conversion/lookup.

SS = Table of **start** times, days, dates, etc., required for periodic codes. All entries are 2 digits, i.e. 010203...

T = **Table** of codes to be printed. For sequential codes this is only the first code in the sequence. For periodic and codes defined in a lookup table, the table contains the entire code set. All entries in the code table must have the number of characters specified by %w.

- Notes: 1. The long format command is restricted to a maximum 48 characters, not counting the font and date offset.
2. The commas delimiting the command components must always be included, even if a component is not used, and when a component is not used its delimiting commas are placed back-to-back.

Examples:

1. Prints a sequential, single letter day of the week code where A = Sunday, B = Monday, etc.:

```
fCArial_150,,%1,D,7,,,A
```

2. Prints a 3-character day of the week code, with the code obtained from a lookup table:

```
fCArial_150,,%3,D,,,,SunMonTueWedThuFriSat
```

- Prints a 3-character month code, with the code obtained from a lookup table. Note the -1 offset, which compensates for the months starting at 01 instead of 00.

```
fCArial_150,,%3,M,,-1,,JanFebMarAprMayJunJulAugSepOctNovDec
```

The same code can be printed without the -1 offset if a dummy month is the first entry in the table:

```
fCArial_150,,%3,M,,,xxxJanFebMarAprMayJunJulAugSepOctNovDec
```

- Prints the month code of example 3 with a 6-month date offset:

```
fCArial_150,6M,%3,M,,-1,,JanFebMarAprMayJunJulAugSepOctNovDec
```

- Prints a 2-character shift code using the quarter hour code and an interval table, with shifts S1, S2, and S3 starting at 00:00 (qtr hour 01), 07:30 (qtr hour 31), and 16:00 (qtr hour 65), respectively:

```
fCArial_150,,%2,q,,,013165,S1S2S3
```

- Prints a quarter-of-the-year code using the month code and an interval table, with quarters beginning the first of January, April, July, and October:

```
fCArial_150,,2M,,,01040710,Q1Q2Q3Q4
```

- Prints the hour in 12-hour format, i.e. 01-12 for 1:xx a.m. to 12:xx p.m., then again for 1:xx p.m. to 12:xx a.m., with the code obtained from a lookup table (remember that midnight is hour 00):

```
fCArial_150,,%2,h,,,,120102030405060708091011
```

The same 12-hour clock code can also be printed with this command, which lists the codes in order from 01-12, and uses an offset of 11 to convert the hour to the correct code:

```
fCArial_150,,%2,h,,11,,010203040506070809101112
```

- Prints a 1-character sequential year code for years xxx0-xxx9, beginning with the letter 'H'.

```
fCArial_150,,%1,Y,10,,,H
```

fLxxxxx – Logo field, prints a logo field that was downloaded to the print head
xxxxx = Name of logo to be printed. A Logo name is limited to 15 characters.

Bar Code Field

There are two bar code field related commands: the 'o' (lower case 'o') command for selecting the bar code type, mil setting, and height, and the 'fB' command for setting the bar code data. Strictly speaking, the 'o' command is a printer command, not a print field command, and as such does not use the 'f' prefix. It is included here simply to keep the bar code commands together.

o<type>,<mil>,<height> – Set bar code properties, where <type> is the bar code type represented as a one or two digit number (see table below), <mil> is the width in mils of a narrow bar, and <height> is the bar code height in print dots (300 dots = 1 inch), excluding human readable. The commas are part of the command format.

<u>Bar Code Type</u>	<u>No.</u>
GTIN-12 (UPC-A)	1
UPC-E	2
GTIN-13 (EAN-13)	3
GTIN-8 (EAN-8)	4
Code 39	5
I 2 of 5	7
GTIN-14 (UCC-128)	14
Code 128	8
Data Matrix	9

Example:

o08,20,115↵ Specifies a Code 128 bar code with a narrow bar width of 20 mils and a height of 115 dots (0.38 inches).

- NOTES:
1. Default bar code properties are type = GTIN-12 (UPC-A), mil = 20, height = 100.
 2. The Clear command ('z') restores the default bar code properties.
 3. The 'o' command must precede the 'fB' command.

fBnnnnnnnnnnnn – Bar code field, prints a bar code of a type and height as specified by the most recent Bar Code Properties command (o<type>,<mil>,<height>).
nnnnnnnnnnnn = Bar code value

NOTE: Bar codes printed by the 'fB' do not include a human readable element. To print human readable use the 'fT' command to print a separate text field.

Complete Bar Code Example

The sequence of commands to print a complete bar code, including human readable, would look like this:

<u>Command</u>	<u>Description</u>
o08,20,115↵	Code 128, 20 mil, height = 115
0v0000↵	Bar code's vertical position
0h0300↵	Bar code's horizontal position
0fB1234567890↵	Bar code data = 1234567890
0v0120↵	Human readable vertical position (5 dots below bar code)
0h0444↵	Human readable horizontal position
0fTArial_30,1234567890↵	Human readable text field w/same data as bar code field

fRwww,hhh - Print a solid region with specified width (www = 1-9999) and height hh = (1-599); used primarily to print bearer bars for bar codes. The complete sequence of commands to print a bar code with bearer bars and human readable is shown below, grouped vertically to more clearly show the commands for each field. The bearer bars are sized and positioned to provide a 0.4" quite zone on either side of the bar code.

Command	Description
1. 0v0000↵ 0h0000↵ 0fR1399,010↵	Top horizontal bearer bar's vertical position Top horizontal bearer bar's horizontal position Region field for top bearer bar, 1399 dots wide, 10 dots high
2. 0v0010↵ 0h0000↵ 0fR0024,095↵	Left side bearer bar's vertical position Left side bearer bar's horizontal position Region field for left side bearer bar, 24 dots wide, 95 dots high
3. 0o7,30,095↵ 0v0010↵ 0h0144↵ 0fB12345678901231↵	I 2 of 5, 30 mil, height = 95 Bar code's vertical position Bar code's horizontal position (0.4" right of left bearer bar) Bar code data = 12345678901231
4. 0v0010↵ 0h1375↵ 0fR0024,095↵	Right side bearer bar's vertical position Right side bearer bar's horizontal position (0.4" right of bar code) Region field for right side bearer bar, 24 dots wide, 95 dots high
5. 0v0105↵ 0h0000↵ 0fR1399,010↵	Bottom bearer bar's vertical position Bottom bearer bar's horizontal position Region field for bottom bearer bar, 1399 dots wide, 10 dots high
6. 0v0120↵ 0h0513↵ 0fTArial_30,12345678901231↵	Human readable vertical position (5 dots below bottom bearer bar) Human readable horizontal position Human readable text field w/same data as bar code field

The illustration below shows all six fields that make up the complete bar code, with vertical separation added for clarity. The numbers 1-6 indicate the order in which the fields are added to the message. They must be added in the order shown – top to bottom and left to right – for the image to print properly.



– **Comment**, any line beginning with # is ignored by the print head.

Connector Pinouts

9-Pin Male	Signal	I/O, Type
1	RESERVED	OEM USE ONLY, DO NOT CONNECT
2	TRANSMIT	OUTPUT, RS232
3	RECEIVE	INPUT, RS232
4	RESERVED	OEM USE ONLY, DO NOT CONNECT
5	GND	SIGNAL GROUND
6	ENCODER	INPUT, ACTIVE<2VDC, 4VDC<INACTIVE<28VDC OR TRISTATE
7	BEACON	OUTPUT, OPEN COLLECTOR (15VDC @ 2.1A max)
8	EXT. PHOTO	INPUT, ACTIVE<2VDC, 4VDC<INACTIVE<28VDC OR TRISTATE
9	POWER	OUTPUT, 15VDC

9-Pin Female	Signal	I/O, Type
1	RESERVED	OEM USE ONLY, DO NOT CONNECT
2	TRANSMIT	OUTPUT, RS232
3	RECEIVE	INPUT, RS232
4	RESERVED	OEM USE ONLY, DO NOT CONNECT
5	GND	SIGNAL GROUND
6	RESERVED	OEM USE ONLY, DO NOT CONNECT
7	RESERVED	OEM USE ONLY, DO NOT CONNECT
8	RESERVED	OEM USE ONLY, DO NOT CONNECT
9	RESERVED	OEM USE ONLY, DO NOT CONNECT

Rev.	EC No.	Description	Date
A	19389	Release	2/2/09
B	19749	Added Photocell Offset	5/6/09
C	19844	Added connector pinouts, updated for new board, and bulk ink	4/20/10
D	19861	Updated for print head firmware ver. 6.3, added 1" print head	6/30/10
E	19928	Updated for print head firmware ver. 6.5: added 'o' command, 'u' command, 'rt' command, expanded bar codes	3/3/11
F	19973	Added ITF, Region, Count Reset, Alternating Banks	7/11/11
G	19988	Continuous print – added print N times	8/24/11
H	20025	Updated for print head firmware ver. 7.5: added long format Sequence Field, long format Calendar Field, example of bar code using region fields to print bearer bars.	