# PD1200 POLE DISPLAY

# PROGRAMMING GUIDE

Congratulations on your purchase of UTC RETAIL's innovative PD1200 Pole Display! Designed to suit virtually any POS environment, the PD1200 Pole Display is as user-friendly as it is customer-friendly. The display features selectable baud rates, 360° pole rotation and 20° tilt.

The PD1200 Pole Display is a 2 line by 20 character vacuum fluorescent display, with four programmable display intensities.  The PD1200 can have a DB9 RS-232 Serial interface, or a standard USB 1.1 interface.

This guide is designed to demonstrate how to efficiently program UTC RETAIL's PD1200 Pole Display.  This guide is not designed for users who are using their PD1200 in an OPOS or JavaPOS Environment.

# PD1200 Pole Display Programming Guide

February, 2004

This Programming Guide was prepared by UTC RETAIL for use by Qualified Service Personnel Only. All attempts have been made to ensure that the information presented in this manual is correct. No liability, expressed or implied, will be assumed by UTC RETAIL, its dealers, or affiliates, for damage resulting from the use of this information.

If a unit needs to be shipped to UTC RETAIL for repairs, please return it in the original packing material and shipping container. If you purchased the PD1200 Pole Display through a dealer, and the dealer is unable to answer your questions, please call UTC RETAIL Technical Support at 1.800.349.0546.

This equipment has been tested and found to comply with the limits for a Class "A" digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

**UTC RETAIL**
100 Rawson Road
Victor, NY 14564
1.800.349.0546
fax: 1.585.924.1434
www.utcretail.com

# TABLE OF CONTENTS

# PRODUCT INFORMATION

The PD1200 is a 2 line, 20 character per line, Vacuum Fluorescent Display (VFD) unit attached to a pole-mounting base.   The serial version of the PD1200 ships factory set for 9600 baud, 8 data bits, and no parity.

## *PD1200 Pole Display Components*

You will find the following components inside the PD1200 Pole Display Box:

- VFD display and pole

- Hat bracket

- Cables

- Wall transformer

## *Features*

The following is a list of the PD1200 Pole Display features:

- 2 Line – 20 Character/Line Vacuum Fluorescent Display

- 10.5 mm Character Height

- 5 x 7 Dot Matrix

- RS232 Serial or USB 1.1

- 360 Degree Rotation

- 10 Degree Bi-directional Tilt

- 4 Selectable Baud Rates (RS-232 Only)

- 4 Programmable Display Intensities

- Flashing Text

- Vertical Scrolling

## *General Specifications*

| NAME | SPECIFICATIONS |
|------|----------------|
| Number of Characters | 2 rows of 20 characters |
| Character Configuration | 5 x 7 Dot Matrix |
| Character Set | ASCII |
| Character Height | 10.5 mm |
| Character Width | 5.5 mm |
| Character Pitch | 7.4 mm (Horizontal) |
| Peak Wave Length of Illumination | Green (505 nm) |
| Luminance | 690 cd/m$^2$ (204fL) |
| Height | 23" |
| Weight | 2.50 lbs. |
| Width | 8.75" |
| Depth | 1.80" |
| Operating Temperature | 0 to +50 degrees C |
| Storage Temperature | -20 to +70 degrees C |
| Relative Humidity | 90% Non-Condensing (Max.) |
| Power Requirements | +5 VDC @ 800 mA |

# *Service and Warranty*

The PD1200 Pole Display comes with a three-year parts and labor warranty. Assistance and customer service is always available from UTC RETAIL Technical Support. If your dealer or service provider cannot answer your questions or provide satisfactory service, please call UTC RETAIL Technical Support. When calling for assistance or service information, please be ready to provide the model number, part number and serial number of the pole display. This information is found on a decal located on the bottom of the pole display.

If the pole display needs to be returned to a repair facility, please use the original packing material and shipping carton.

The address and telephone numbers to be used for assistance, service, and warranty information are:

**UTC RETAIL**
100 Rawson Road
Victor, NY 14564
1.800.349.0546
fax: 1.585.924.1434
www.utcretail.com

# PROGRAMMING

The PD1200 Pole Display operates by converting recognized data, supplied by a communicating device, into a display message. The supplied data may also contain commands that control the display.

The PD1200 uses a limited command structure for display control, requiring minimal programming effort. Table 3-1 lists the display control features of the PD1200 and control codes (in ASCII, DEC, and HEX expression). The display control command structure, with examples, is described in this section.

## *Display Control Features and Commands*

The following table outlines the PD1200 Pole Display control features and commands:

| FEATURE | ASCII | DEC | HEX |
|---|---|---|---|
| Dimming* | <EOT>x | 4, x | 04, xx |
| Back Space | <BS> | 8 | 08 |
| Horizontal Tab | <HT> | 9 | 09 |
| Line Feed | <LF> | 10 | 0A |
| Carriage Return | <CR> | 13 | 0D |
| Display Position* | <DLE>p | 16,p | 10,pp |
| Normal Display | <DC1> | 17 | 11 |
| Vertical Scrolling | <DC2> | 18 | 12 |
| Reset | <US> | 31 | 1F |
| Flashing Text Start* | <FS> | 28 | 1C |
| Flashing Text Stop* | <GS> | 29 | 1D |
| Clear to End of Line** | <CAN> | 24 | 18 |
| Clear to End of Display** | <EM> | 25 | 19 |
| Home and Clear Display | <RS> | 30 | 1E |

* See command subsection for special information regarding the USB PD1200
** This command is not supported on the USB PD1200

# Display Control

The command and data sequence for all display control features follows the following structure:

***Dimming        <EOT>x        04 DEC        04 HEX***

# Dimming Feature

The dimming command sets the brightness level for the characters displayed.

Where x is the option byte:

|       |     | Dim   | Low   | Medium | High   |
|-------|-----|-------|-------|--------|--------|
| x     | =   | 20h   | 40h   | 60h    | FFh    |

***USB Note:  Both bytes of the command must be sent in one write to the port, splitting the bytes between writes will not work.***

| DIMMING LEVEL | ASC II | DEC | HEX |
|---------------|--------|-----|-----|
| 100 %         | -      | 255 | FF  |
| 60 %          | '      | 96  | 60  |
| 40 %          | @      | 64  | 40  |
| 20 %          | Space  | 32  | 20  |

# Back Spacing Feature

***Back Spacing        <BS>        08 DEC        08 HEX***

When the backspace command is executed, the write-in position is shifted to the left one position, erasing the character, if any, in that position. When the write-in position is in the first (read from left to right) position of the first row, the write-in moves to the last position of the second row. When the write-in is in the first position of the second row, the write-in moves to the last position of the first row.

# Horizontal Tab Feature

*Horizontal Tab <HT>*          *09 DEC*          *09 HEX*

**DC1 Mode**

(Normal Display Mode)

The write-in position is shifted to the right one position. When the write-in is in the last position of the first row, the write-in moves to the first position of the second row. When the write-in is in the last position of the second row, the write-in moves to the first position of the first row.

**DC2 Mode**

(Vertical Scroll Mode)

When the write-in is in the last position of the second row, the characters displayed in the second row are shifted up to the first row and the write-in moves to the first position of the second row. This action clears the second row.

# Line Feeding Feature

*Line Feeding          <LF>          10 DEC          0A HEX*

**DC1 Mode**

(Normal Display Mode)

The write-in moves up or down to another row, staying in the same horizontal position.

**DC2 Mode**

(Vertical Scroll Mode)

When the write-in is in the second row, the characters displayed there are shifted up to the first row, leaving the write-in at its present position. This action clears the second row. When the write-in is in the first row, the write-in moves down to the second row.

# Carriage Return Feature

*Carriage Return          <CR>          13 DEC          0D HEX*

The write-in moves to the first position of the same row.

# Display Position Feature

*Display Position*      *<DLE>Tab Over*    *16 DEC*    *10 HEX*

After writing the <DLE> character to the display, enter a position byte from the following Character Position Chart (HEX):

***USB Note: Both bytes of the command must be sent in one write to the port, splitting the bytes between writes will not work.***

**ROW**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 0C | 0D | 0E | 0F | 10 | 11 | 12 | 13 |
| 2 | 14 | 15 | 16 | 17 | 18 | 19 | 1A | 1B | 1C | 1D | 1E | 1F | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |

# Normal Display Mode Feature

*Normal Display Mode <DC1>Tab Over*      *17 DEC*      *11 HEX*

After writing a character, the write-in is shifted automatically to the right one position. When the write-in is in the last position of the first row, the write-in moves to the first position of the second row. When the write-in is in the last position of the second row, the write-in moves to the first position of the first row.

# Vertical Scroll Mode Feature

*Vertical Scroll Mode*      *<DC2>Tab Over*      *18 DEC*      *12 HEX*

After writing the characters up to the last position of the second row, all characters displayed in the second row are shifted to the upper row (first row), clearing the second row.

# Reset Feature

*Reset*      *<US>*      *31 DEC*      *1F HEX*

All characters displayed are erased, and the write-in position (cursor position) is set in the first position of the first row. The display mode returns to the power-on default set-up.

# Flashing Text Start Feature

*Flashing Text Start*          *<FS>*          *28 DEC*          *1C HEX*

After receipt of this command, all subsequent data received will flash, until a <GS> command is received. Flashing will be terminated with the flashing text stop command.

   *USB Note:  The USB PD1200 only supports flashing of the entire screen. Sending the <FS> command will cause the entire screen to flash.*

# Flashing Text Stop Feature

*Flashing Text Stop*          *<GS>*          *29 DEC*          *1D HEX*

After receipt of this command, the characters following will not flash.

   *USB Note:  The USB PD1200 only supports flashing of the entire screen. Sending the <GS> command will cause the entire screen to stop flashing.*

# Clear to End of Line Feature

*Clear to End of Line*          *<CAN>*          *24 DEC*          *18 HEX*

This command will clear out the display from the current write-in position to the end of the current line. The current write-in position will not change.

   *USB Note:      This command is not supported on the USB PD1200*

# Clear to End of Display Feature

*Clear to End of Display*          *<EM>*          *25 DEC*          *19 HEX*

This command will clear out the display from the current write-in position to the end of the second line. The current write-in position will not change.

   *USB Note:      This command is not supported on the USB PD1200*

# Home and Clear Display Feature

*Home and Clear Display*          *<RS>*          *30 DEC*          *1E HEX*

This command will clear the display and move the write-in position to the first position of the first row.

# Display Character Codes

Refer to the ASCII Character Set in the table on Page 15, for a full listing of the display character codes used by the PD1200.
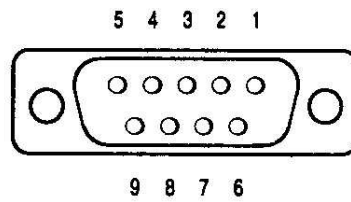
# TECHNICAL INFORMATION

## *Cable Pinouts*

The PD1200 Pole Display cable connections can be configured to user specifications. The following graphic shows a typical RS232 (serial) pinout.

**DB9 Female**                                          **RS232 Pinout**
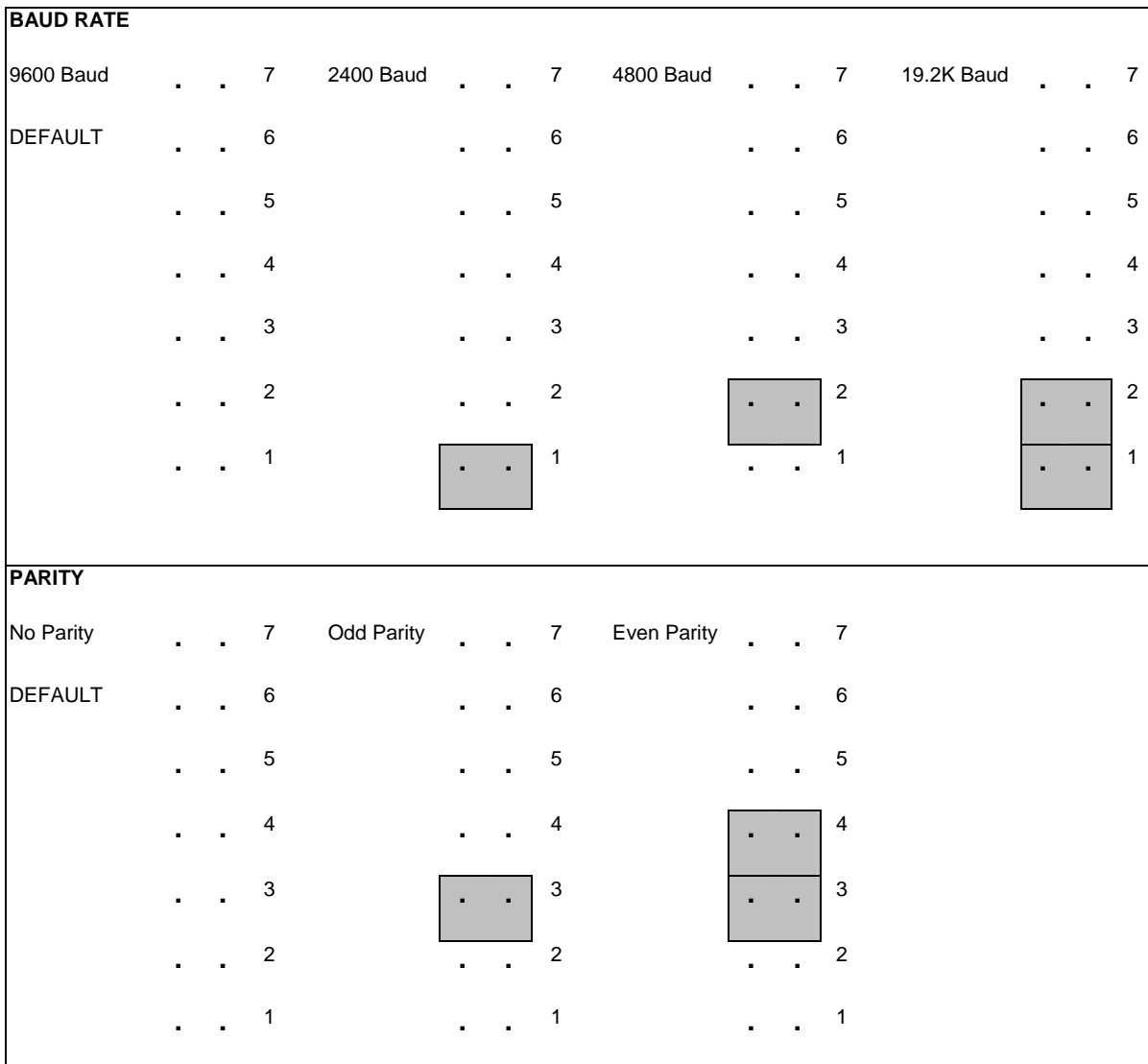
1

2

3 Receive Data

4

5 Ground

6

7

8

9 +5VDC Input

# *Serial Operating Parameters Selection*

The RS-232 PD1200 ships factory set for 9600 baud and no parity.   This can be changed by removing the Lens cover.  Push the (2) tabs in on the bottom side of the display and rotate the cover off, starting at the tab side.  Once the lens is removed, shorting jumpers (supplied) can be added to change both the baud rate and/or parity.

The diagram below shows positions of the shorting jumpers needed for different baud rates and parities.  Up to 4 shorting jumpers may be needed.

**BAUD RATE**

| 9600 Baud | 2400 Baud | 4800 Baud | 19.2K Baud |
|---|---|---|---|

DEFAULT

**PARITY**

| No Parity | Odd Parity | Even Parity |
|---|---|---|

DEFAULT

### USB Operating Parameters Selection

The USB PD1200 can be assigned to any virtual COM port using the configuration utility that is shipped with the driver, and any Baud-Rate / parity can be used with the virtual COM port.  The driver can be found at **http://www.utcretail.com**

## *ASCII Character Set*

| DEC | HEX | ASCII | DEC | HEX | ASCII | DEC | HEX | ASCII | DEC | HEX | ASCII |
|-----|-----|-------|-----|-----|-------|-----|-----|-------|-----|-----|-------|
| 0 | 00 | Ctrl-@ (NUL) | 32 | 20 | Space | 64 | 40 | @ | 96 | 60 | ` |
| 1 | 01 | Ctrl-A (SOH) | 33 | 21 | ! | 65 | 41 | A | 97 | 61 | a |
| 2 | 02 | Ctrl-B (STX) | 34 | 22 | " | 66 | 42 | B | 98 | 62 | b |
| 3 | 03 | Ctrl-C (ETX) | 35 | 23 | # | 67 | 43 | C | 99 | 63 | c |
| 4 | 04 | Ctrl-D (EOT) | 36 | 24 | $ | 68 | 44 | D | 100 | 64 | d |
| 5 | 05 | Ctrl-E (ENQ) | 37 | 25 | % | 69 | 45 | E | 101 | 65 | e |
| 6 | 06 | Ctrl-F (ACK) | 38 | 26 | & | 70 | 46 | F | 102 | 66 | f |
| 7 | 07 | Ctrl-G (BEL) | 39 | 27 | ' | 71 | 47 | G | 103 | 67 | g |
| 8 | 08 | Ctrl-H (BS) | 40 | 28 | ( | 72 | 48 | H | 104 | 68 | h |
| 9 | 09 | Ctrl-I (HT) | 41 | 29 | ) | 73 | 49 | I | 105 | 69 | i |
| 10 | 0A | Ctrl-J (LF) | 42 | 2A | * | 74 | 4A | J | 106 | 6A | j |
| 11 | 0B | Ctrl-K (VT) | 43 | 2B | + | 75 | 4B | K | 107 | 6B | k |
| 12 | 0C | Ctrl-L (FF) | 44 | 2C | , | 76 | 4C | L | 108 | 6C | l |
| 13 | 0D | Ctrl-M (CR) | 45 | 2D | - | 77 | 4D | M | 109 | 6D | m |
| 14 | 0E | Ctrl-N (SO) | 46 | 2E | . | 78 | 4E | N | 110 | 6E | n |
| 15 | 0F | Ctrl-O (SI) | 47 | 2F | / | 79 | 4F | O | 111 | 6F | o |
| 16 | 10 | Ctrl-P (DLE) | 48 | 30 | 0 | 80 | 50 | P | 112 | 70 | p |
| 17 | 11 | Ctrl-Q (DC1) | 49 | 31 | 1 | 81 | 51 | Q | 113 | 71 | q |
| 18 | 12 | Ctrl-R (DC2) | 50 | 32 | 2 | 82 | 52 | R | 114 | 72 | r |
| 19 | 13 | Ctrl-S (DC3) | 51 | 33 | 3 | 83 | 53 | S | 115 | 73 | s |
| 20 | 14 | Ctrl-T (DC4) | 52 | 34 | 4 | 84 | 54 | T | 116 | 74 | t |
| 21 | 15 | Ctrl-U (NAK) | 53 | 35 | 5 | 85 | 55 | U | 117 | 75 | u |
| 22 | 16 | Ctrl-V (SYN) | 54 | 36 | 6 | 86 | 56 | V | 118 | 76 | v |
| 23 | 17 | Ctrl-W (ETB) | 55 | 37 | 7 | 87 | 57 | W | 119 | 77 | w |
| 24 | 18 | Ctrl-X (CAN) | 56 | 38 | 8 | 88 | 58 | X | 120 | 78 | x |
| 25 | 19 | Ctrl-Y (EM) | 57 | 39 | 9 | 89 | 59 | Y | 121 | 79 | y |
| 26 | 1A | Ctrl-Z (SUB) | 58 | 3A | : | 90 | 5A | Z | 122 | 7A | z |
| 27 | 1B | Ctrl-[ (ESC) | 59 | 3B | ; | 91 | 5B | [ | 123 | 7B | { |
| 28 | 1C | Ctrl-\ (FS) | 60 | 3C | < | 92 | 5C | \ | 124 | 7C | \| |
| 29 | 1D | Ctrl-] (GS) | 61 | 3D | = | 93 | 5D | ] | 125 | 7D | } |
| 30 | 1E | Ctrl-^ (RS) | 62 | 3E | > | 94 | 5E | ^ | 126 | 7E | ~ |

| DEC | HEX | ASCII | DEC | HEX | ASCII | DEC | HEX | ASCII | DEC | HEX | ASCII |
|-----|-----|-------|-----|-----|-------|-----|-----|-------|-----|-----|-------|
| 31 | 1F | Ctrl-_ (US) | 63 | 3F | ? | 95 | 5F | _ | 127 | 7F | DEL |

# INDEX