



J2 650 LCM Customer Display

Manual

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LCM Customer Display

Overview

The 650 LCM (Liquid Crystal display Module) Customer Display is a two line by twenty character, high contrast customer side display with 9mm high characters. The characters are black on a white background. The display is the trans-reflective type with a white LED backlight and a wide viewing angle for use in high and low light conditions. The 650 customer display mounts to the back of the 650 and is powered from the 650; no external power supply is needed.

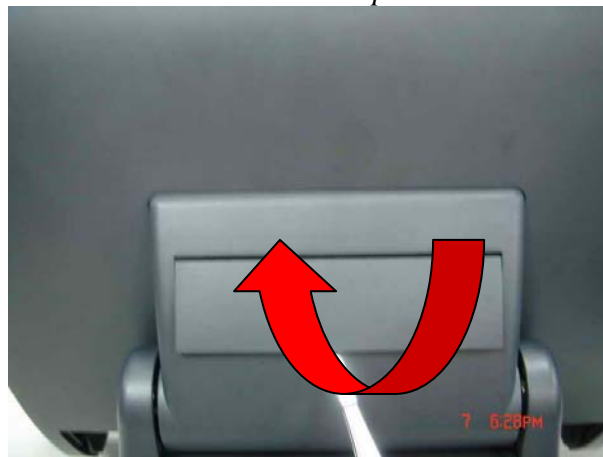
650 LCM Customer Display



Mounting

The 650 LCM customer display is mounted to the back of the 650 as shown above. The first step to installing the display is to remove the customer display mounting point cover plate as shown.

Remove cover plate



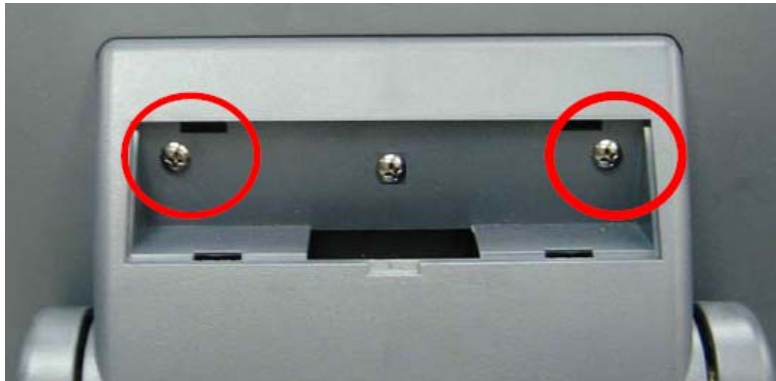
First install the center screw, the screw is provided with the customer display kit. The screw keeps the two outside screw holes aligned when the screws are removed.

Center Screw



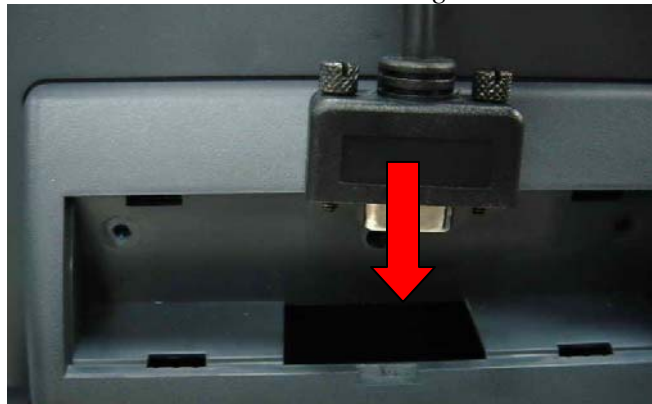
Then remove the two outside screws shown below.

Remove these two screws

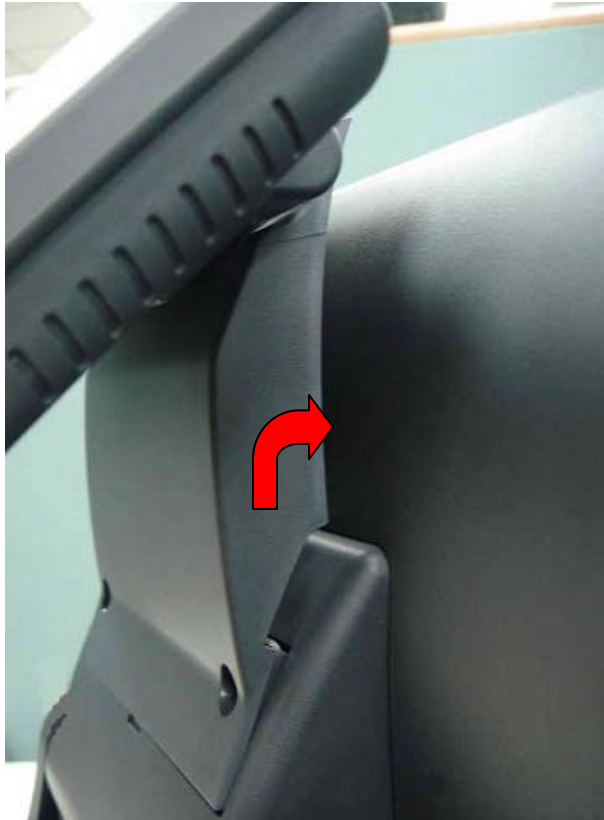


Now feed the customer display interface cable through the hole as shown.

Feed cable Through



Insert the two tabs into the alignment holes then push down the display. The display is spring loaded and will require some pressure to mount flush to the back of the unit.



Install the two mounting screws that came with the customer display kit, they are longer than the two screws that were removed earlier.

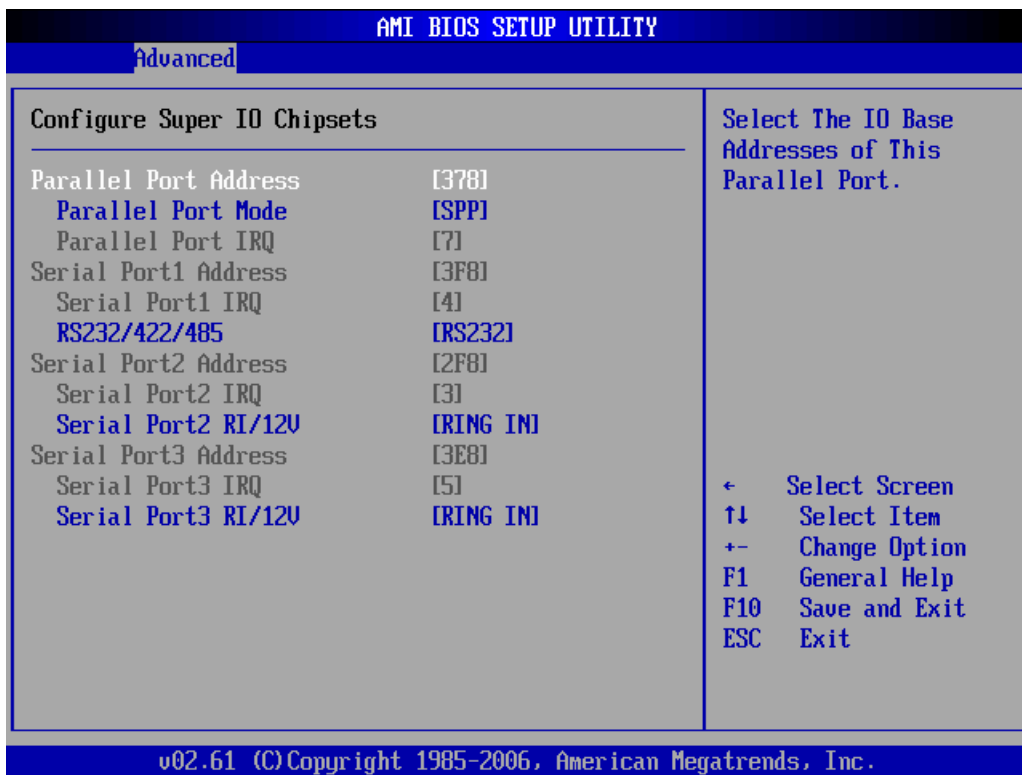
Mounting screws



Connecting Interface Cable

With the 650 turned off plug the customer display interface into either COM 2 or COM 3 and secure the interface cable with its locking screws. Now power up the 650 and hit the DEL key to enter the BIOS. When the BIOS screen appears use the TAB key to select *Advanced*. Use the arrow keys to select *Super IO Configuration* then type ENTER. The screen below will appear. Use the arrow keys to select *Serial Port2 (3) RI/12V* depending on what port the customer display is connected to. Select *12V* to enable power to the correct COM port. Type F10 to save the settings and exit the BIOS setup.

NOTE: Never enable the 12 V without the customer display attached and be sure to disable the 12 V before removing the customer display.



Customer Display Configuration

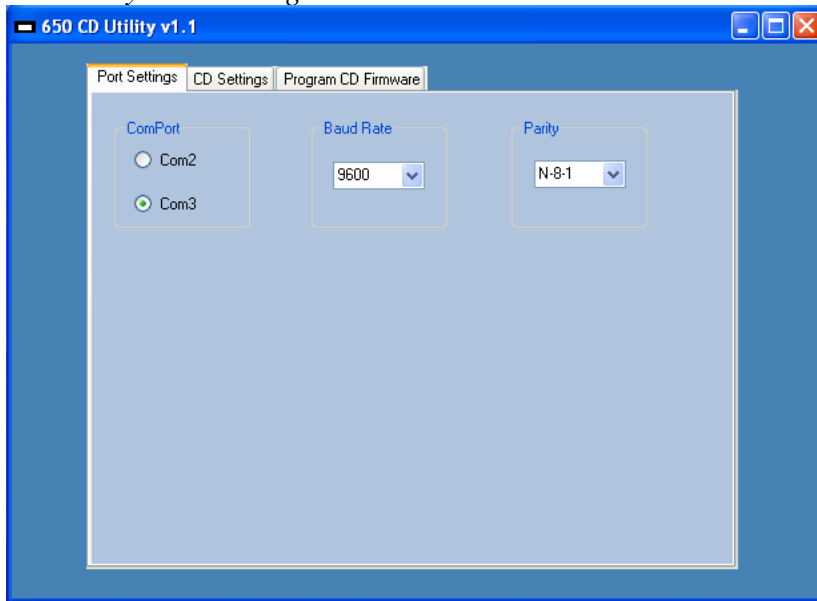
Port Settings

The 650 customer display default settings are USA character set, EPSON emulation mode, and the serial port programmed to a baud rate of 9600 and 8 bits data, no parity and one stop bit. The configuration can be changed by using the J2 650 Customer Display utility that can be downloaded from the J2 Web page (link below). The current configuration of the customer display is shown on the display itself when power up.

<http://www.j2retailsystems.com/support/650/>

When the CD (Customer Display) utility is run the *Port Settings* screen is displayed as shown below. The Baud Rate and Parity shown on the Port Setting screen must match the settings currently programmed into the customer display. These settings are displayed on the Customer Display on power up. Also the correct COM port needs to be selected to match the COM (serial) port that the display is plugged into.

CD Utility Port Setting Screen

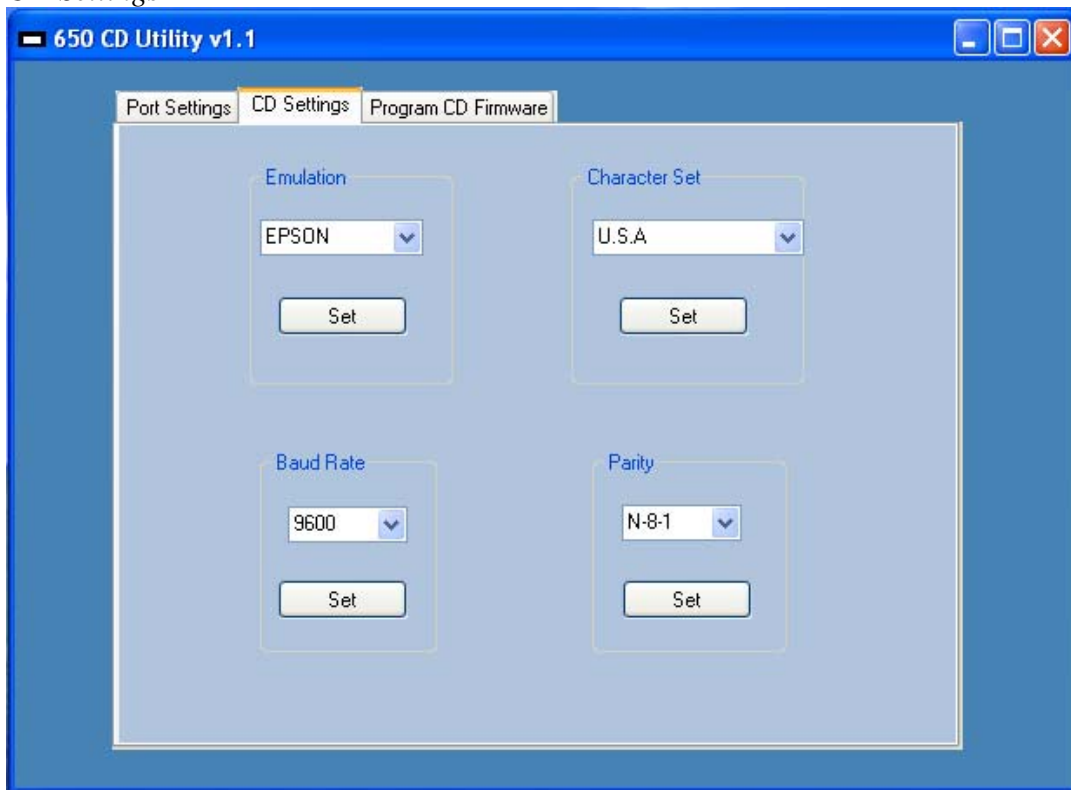


Set the *ComPort*, *Baud Rate* and *Parity* to match the current setting of the customer display. Once this is done the setting of the display may be changed.

CD Settings

The next tab for the program the *CD Settings* allows the Customer Display configuration to be changed. The emulation mode, character set (font) and serial port settings may be changed here. The setting is selected with the dropdown menu in each dialog box. The setting is only changed when the *Set* button in the dialog box is clicked.

CD Settings



Emulation Mode

There are currently three emulation modes supported by the 650 customer display. They are *EPSON*, *UTC STD* and *CD7220*. A list of commands supported by each emulation mode is listed later in this manual. Use the drop down menu to select the emulation mode and use the *Set* Button to send the command to the display.

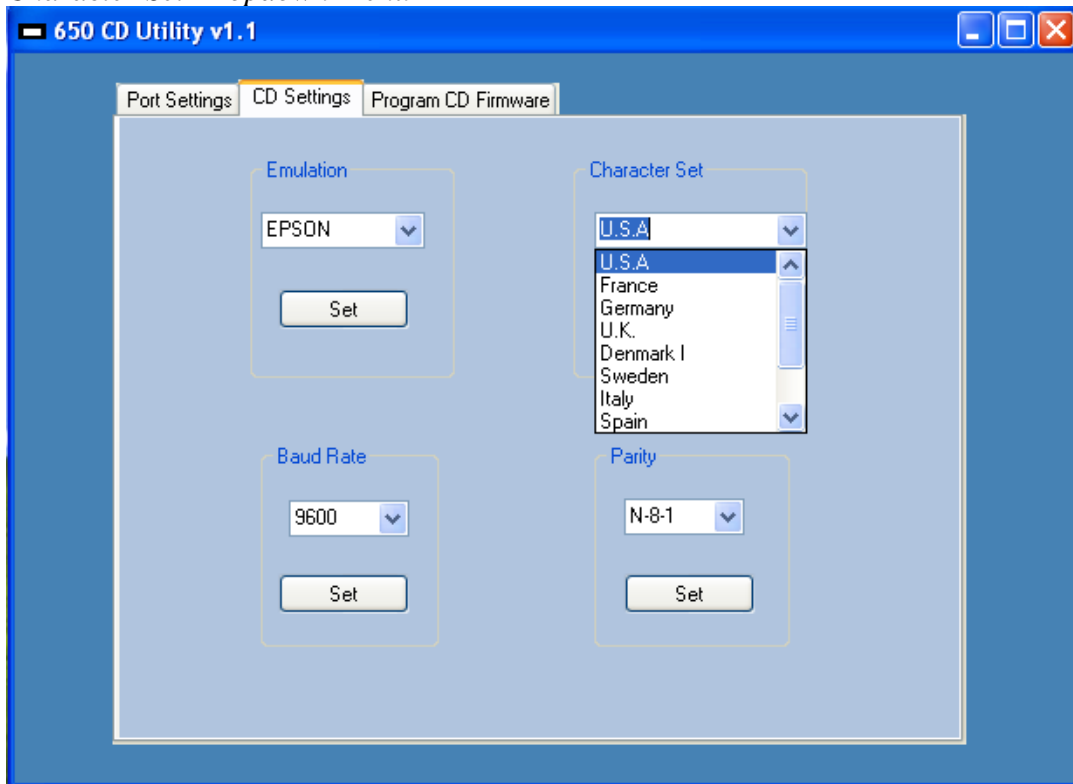
Character Sets

The ASCII character set used by the display is set via the *Character Set* dialog box with 9 character sets supported. This setting will remap the characters shown on the table below. A subset of the PC-858 code page is used for characters in the range of 0x80~0xFF and includes the EURO character at location 0xD5.

Character Sets

	0x23	0x24	0x40	0x5B	0x5C	0x5D	0x5E	0x60	0x7B	0x7C	0x7D	0X7E
USA	#	\$	@	[\]	^	`	{		}	~
FRANCE	#	\$	à	°	Ç	§	^	`	é	ù	è	¨
GERMANY	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
UK	£	\$	@	[\]	^	`	{		}	~
DENMARK 1	#	\$	@	Æ	Φ	Å	^	`	æ	ø	å	~
SWEDEN	#	α	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ITALY	#	\$	@	°	\	é	^	ù	à	ò	è	ì
SPAIN	#	\$	@	[Ñ	¿	^	`	¨	ñ	}	~
NORWAY	#	α	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
DENMARK II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

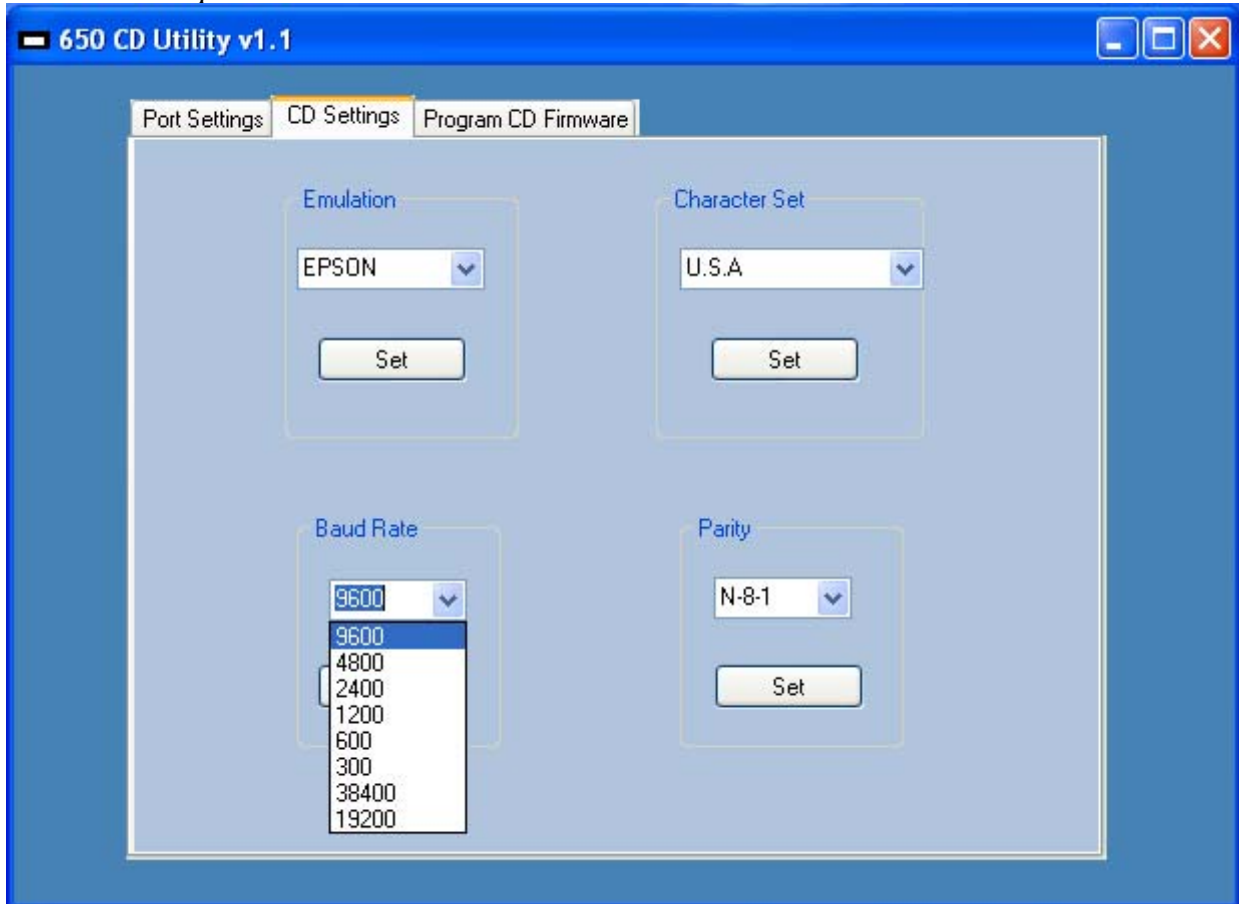
Character Set Dropdown Menu



Baud Rate

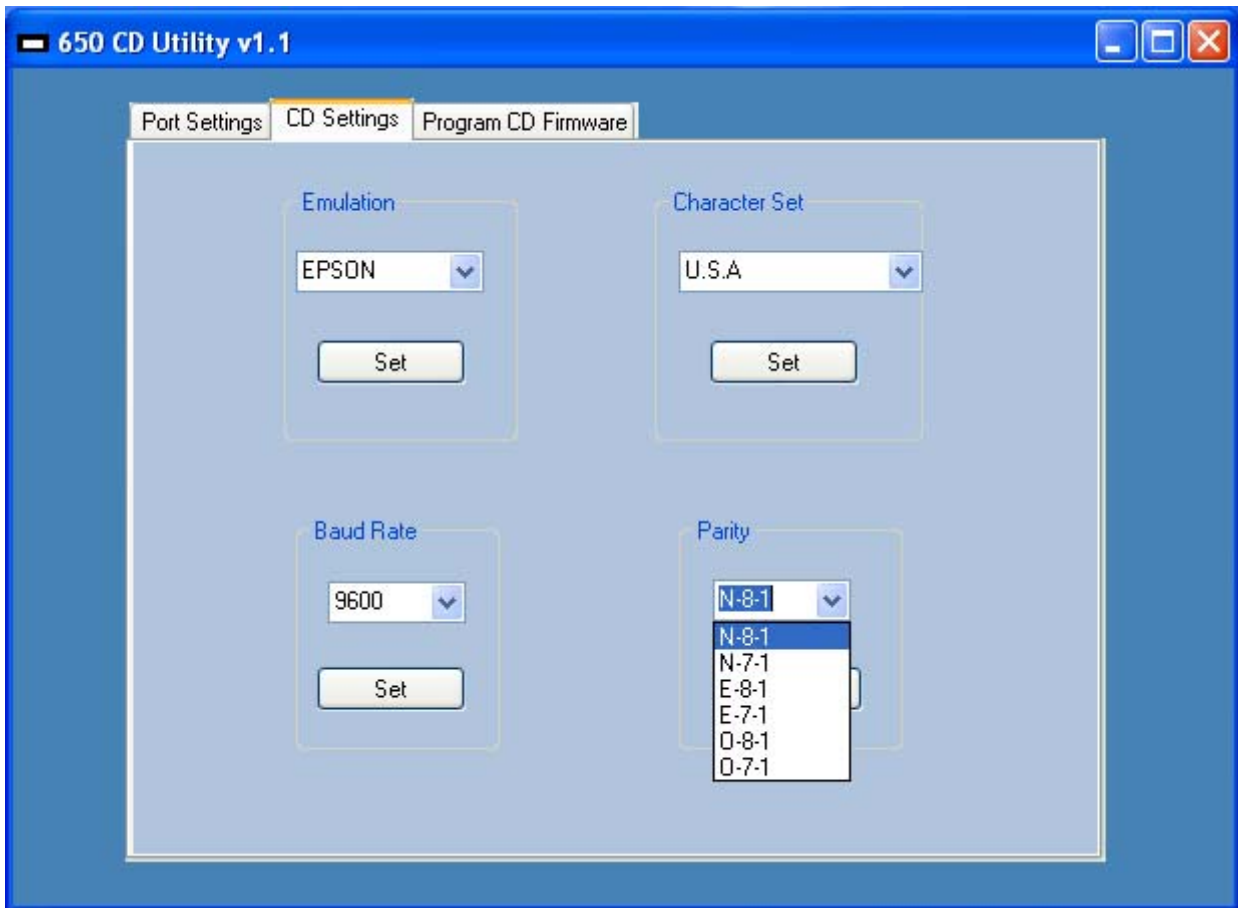
The serial port's baud rate for the customer display can be changed using the *Baud Rate* dialog box. Select the desired baud rate from the drop down menu shown below. Click the *Set* button and the baud rate of the display is changed immediately after the command is received. The *Port Settings* must now be changed to match the new baud rate for any other settings to be changed. There are 8 possible baud rate settings with the factory default set to 9600 baud.

Baud Rate Dropdown



Parity

The parity and stop bits settings of the customer display can be changed using the *Parity* dialog box. Select the parity and stop bits setting desired from the drop down menu shown below. When the Set button is clicked the command is sent to the display and the parity and stop bits settings for the display is changed immediately after the command is received. The *Port Settings* must now be changed to match the new parity and stop bits settings for any other settings to be changed



Firmware Update

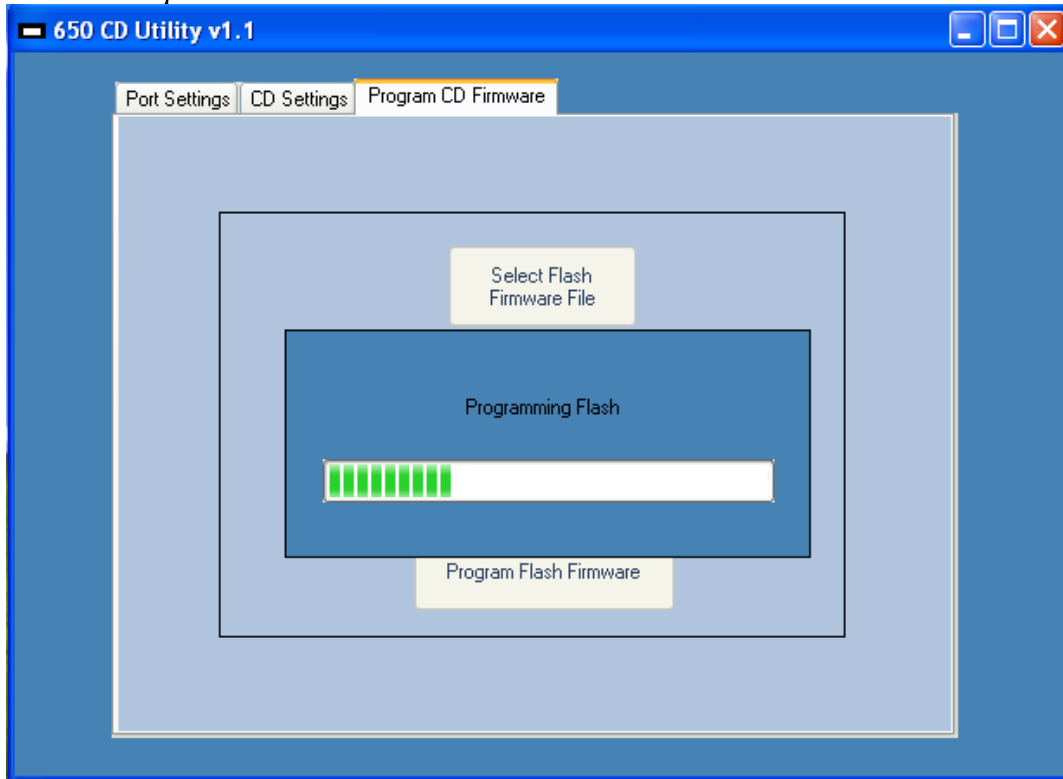
There firmware of the 650 customer display can be updated if required. The current version of firmware for the customer display at the time of the writing of this manual is Version 1.1. Any updates to the firmware will be posted on the J2 web site.

To update the firmware use the *Select Flash Firmware File* button to browse the computer for the file. The firmware file will always have the extension .hex. Once the proper file is selected click on the *Program Flash Firmware* dialog button to start the update. The customer display must be set for 9600 baud and parity and stops bits set to 8 N 1.

The CD utility will now send the firmware file to the customer display and update its flash memory. A count will display as the file is received. Once the programming is complete the display will reset and show the default settings for the new firmware.

If for some reason there was a problem in updating the firmware the customer display will display the message “Waiting for program file at 9600 baud” when powered up. This message can be cleared by reprogramming.

Firmware Update



EPSON mode

ASCII	Hex	Function
HT	0x09	move cursor right
BS	0x08	move cursor left
LF	0x0A	move cursor down one line
CR	0x0D	move cursor left most position
VT	0x0B	move cursor to home position
CLR	0x0C	clear display, home cursor
CAN	0x18	clear current line, cursor to position one
ESC @	0x1B 0x40	reset display, display configuration info
US LF	0x1F 0x0A	move cursor up one line
US CR	0x1F 0x0D	move cursor right most position
US B	0x1F 0x42	move cursor to bottom position
US \$ x y	0x1F 0x24 0x01~20 0x01~02	move cursor to specified position x = 1-20 in hex ,y = 1 or 2 in hex
ESC R n	0x1B 0x52 0x00~0f	set ASCII character set (see table)
US SOH	0x1F 0x01	set overwrite mode (default)
US STX	0x1F 0x02	set vertical mode

Notes: Non-supported EPSON functions will cause no affect. Commands shaded is green are the ones recommend for new software and are common to the CD7220 mode.

CD7220 mode

ASCII	Hex	Function
HT	0x09	move cursor right
BS	0x08	move cursor left
LF	0x0A	move cursor down one line
CR	0x0D	move cursor left most position
VT	0x0B	move cursor to home position
CLR	0x0C	clear display, home cursor
CAN	0x18	clear current line, cursor to position one
ESC @	0x1B 0x40	reset display, display configuration info
ESC [C	0x1B 0x5B 0x43	move cursor right
ESC [D	0x1B 0x5B 0x44	move cursor left
ESC [B	0x1B 0x5B 0x42	move cursor down one line
ESC [R	0x1B 0x5B 0x52	move cursor right most position
ESC [L	0x1B 0x5B 0x4C	move cursor left most position
ESC [H	0x1B 0x5b 0x48	move cursor to home position
ESC [K	0x1B 0x5b 0x4B	move cursor to bottom position
ESC I x y	0x1B 0x6C 0x01~20 0x01~02	move cursor to specified position x = 1-20 in hex ,y = 1 or 2 in hex
ESC c n	0x1B 0x63 0x00~0f	set ASCII character set (see table)
ESC DC1	0x1B 0x11	set overwrite mode (default)
ESC DC2	0x1B 0x12	set vertical mode

Note: Commands shaded in green are common to EPSON Mode.

UTC STD mode

ASCII	Hex	Function
HT	0x09	move cursor right
BS	0x08	move cursor left
LF	0x0A	move cursor down one line
CR	0x0D	move cursor left most position
VT	0x0B	move cursor to home position
RS	0x1E	clear display, home cursor
EM	0x19	clear to end of display
US	0x1F	reset display, display configuration info
TAB x	0x10 0x00~0x27	move cursor to specified position x = 0~39
DC1	0x11	set overwrite mode (default)
DC2	0x12	set vertical mode

Note: Commands shaded in green are common to EPSON and CD7220 Mode.

Common Commands, All Modes

Cursor Right, <HT>, 0x09 (EPSON, CD7220, UTC STD)

(Overwrite Display Mode)

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

(Vertical Scroll Mode)

When the cursor 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 cursor moves to the first position of the second row. This action clears the second row.

Cursor Left, <BS>, 0x08 (EPSON, CD7220, UTC STD)

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

Line Feed, <LF>, 0x0A (EPSON, CD7220, UTC STD)

(Overwrite Display Mode)

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

(Vertical Scroll Mode)

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

When the cursor is in the first row; the cursor moves down to the second row in the same vertical position.

Carriage Return, <CR>, 0x0D (EPSON, CD7220, UTC STD)

The cursor moves to the first position of the same row.

Home and Clear Display, <CLR>, 0x0C (EPSON, CD7220)

This command will clear the display and move the cursor position to the first position of the first row.

Clear Line, <CAN>, 0x18 (EPSON, CD7220)

This command will clear the line the cursor is on and place the cursor in position one of that line.

Specific EPSON Mode Commands

Reset, <ESC @>, 0x1B 0x40

All characters displayed are erased, and the cursor position (cursor position) is set in the first position of the first row. The display mode returns to the overwrite mode.

Cursor UP, <US LF>, 0x1F 0x0A

(Overwrite mode)

Move the cursor up one line to the same column as on the lower line.

(Vertical Scroll Mode)

The characters displayed on the upper line are scrolled to the lower line and the upper line is cleared. The cursor will remain in the same position.

End of Line, <US CR>, 0x1F 0x0D

Move the cursor to the end of the current line. No characters are overwritten.

End of Display, <US B>, 0x1F 0x42

Move the cursor to the last position of the second row of the display. No characters are overwritten.

Cursor Positioning, <US \$ x y>, 0x1F 0x24 0x01~20 0x01~02

Move the cursor to the display position indicated by the x and y values. The x value is a binary value 1~20 representing the position on the line. The y value, either 1 or

2, specifies line one or two. The character written to the display will display at this position.

Set ASCII Character Set, <ESC R n>, 0x1B 0x52 0x00~0F

This command will set which international ASCII font is used. The n value is show in the table below. The characters displayed are show on a table earlier in this section.

n	Font
0x00	USA (default)
0x01	FRANCE
0x02	GERMANY
0x03	UK
0x04	DENMARK 1
0x05	SWEDEN
0x06	ITALY
0x07	SPAIN
0x09	NORWAY
0x0A	DENMARK 2

Overwrite Display Mode, <US SOH>, 0x1F 0x01 (Default mode)

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

Vertical Scroll Mode, <US STX>, 0x1F 0x02

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.

Specific CD7220 Mode Commands

Cursor Right, <ESC [C>, 0x1B 0x5B 0x43(duplicate command)

(Overwrite Display Mode)

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

(Vertical Scroll Mode)

When the cursor 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 cursor moves to the first position of the second row. This action clears the second row.

Cursor Left, <ESC [D>, 0x1B 0x5B 0x44 (duplicate command)

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

Line Feed, <ESC [B>, 0x1B 0x5B 0x42 (duplicate command)

(Overwrite Display Mode)

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

(Vertical Scroll Mode)

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

Carriage Return, <ESC [L>, 0x1B 0x5B 0x4C (duplicate command)

The cursor moves to the first position of the same row.

End of Line, <ESC [R>, 0x1B 0x5B 0x52

Move the cursor to the end of the current line. No characters are overwritten.

End of Display, <ESC [K>, 0x1B 0x5B 0x4B

Move the cursor to the last position of the second row of the display. No characters are overwritten.

Home Cursor, <ESC [H>, 0x1B 0x52 0x48

This command will move the cursor position to the first position of the first row. No characters are overwritten.

Cursor Positioning, <ESC I x y>, 0x1B 0x6C 0x01~20 0x01~02

Move the cursor to the display position indicated by the x and y values. The x value is a binary value 1~20 representing the position on the line. The y value, either 1 or 2, specifies line one or two. The character written to the display will display at this position.

Overwrite Display Mode, <ESC DC1>, 0x1B 0x11 (Default mode)

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

Vertical Scroll Mode, <ESC DC2>, 0x1B 0x12

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.

Specific UTC STD Mode Commands

Display Position, <DLE n>, 0x10 0x00~27

After writing the <DLE> character to the display, write a position byte. Valid values are 0-39 DEC with zero being the first row left most position and 39 DEC being the second row most right position.

Overwrite Display Mode, <DC1>, 0x11

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

Vertical Scroll Mode, <DC2>, 0x12

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 <US>, 0x1F

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

Clear to End of Line, <CAN>, 0x18

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

Clear to End of Display, , 0x19

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

Home and Clear Display, <RS>, 0x1E

This command will clear the display and move the cursor position to the first position of the first row.

System Command**Set Baud Rate, <STX ENQ B n ETX>, 0x02 0x05 0x42 0x30~37 0x03**

Set the baud rate of the customer display to the value specified by “n” as shown in the table below. The new baud rate will take affect when the last character of the command is received.

n	Baud Rate
30	9600 (default)
31	4800
32	2400
33	1200
34	600
35	300
36	38400
37	19200

Set Parity, <STX ENQ P n ETX>, 0x02 0x05 0x50 0x31~36 0x03

This command sets the parity type and number of data bits that the customer display uses to the value specified by “n” as show in the table below. The new settings will take affect when the last character of the command is received.

n	Parity
0x31	N-8-1 (default)
0x32	N-7-1
0x34	E-8-1
0x35	E-7-1
0x35	O-8-1
0x36	O-7-1

Emulation mode, <STX ENQ C n ETX>, 0x02 0x05 0x43 0x30~37 0x03

This command sets the emulation mode that the customer display uses to the value specified by “n” as show in the table below. The new settings will take affect when the last character of the command is received.

n	Emulation
0x31	EPSON (default)
0x36	UTC STD
0x37	CD7220

ASCII Character Set <STX ENQ S n ETX>, 0x02 0x05 0x53 0x30~3A 0x03

This command sets the character set that the customer display uses to the value specified by “n” as show in the table below. The new settings will take affect when the last character of the command is received.

n	Font
0x30	USA (default)
0x31	FRANCE
0x32	GERMANY
0x33	UK
0x34	DENMARK 1
0x35	SWEDEN
0x36	ITALY
0x37	SPAIN
0x39	NORWAY
0x3A	DENMARK 2

Reset to Factory Defaults <STX ENQ S 3 ETX>, 0x02 0x05 0x53 0x31 0x03

This command resets the customer display to the factory defaults. EPSON mode, USA character font, 9600 baud, 8-N-1 parity, overwrite mode.