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# VFD Customer Display

Model VFD-16150 Series

## 1. Information

### A. Standard Package:

- |                                    |      |
|------------------------------------|------|
| 1. Display Unit                    | 1 PC |
| 2. User's Manual                   | 1 PC |
| 3. RS-232 Setting software CD Disk | 1 PC |
| 4. Power Kit                       | 1 PC |
- To retrieve power 12V DC from switching power supply inside computer

### B. Features and Specifications:

#### Features:

- Capable of showing Chinese, Korean, Japanese, Thai, Arabian and other languages
- Available in 2 housings and customized colors
- Pass-through function to lessen cable connection
- VFD display with 20 characters x 2 lines, all characters are formed by 16 x 15 dots

#### Specifications:

##### Tube Display

Customer display	Vacuum Fluorescent Display
Display pattern	15 x 16 dot matrix
Brightness	1000 cd/m <sup>2</sup>
Character type	ISO, Big 5, GB, JIS, Hangul, Thai...
Character size	6.525mm(W) x 9.77mm(H)
Character number	20 x 2

### Environment

Operating temperature	0°C to +40°C
Storage temperature	-10°C to +50°C
Relative humidity	0% to 90% RH

### Electricity

Power source	DC +24V ~ +12V(Optional +12V, +24V)	
Power consumption	15 watts maximum 3 watts average	
Central control unit	CPU ROM RAM	8031 BH 64K flash ROM 32K SRAM
Speed	CPU	11.0592 MHz
Connector	D-SUB 9 Female	

### Overall Dimensions (VFD-1615A)

Dimension (panel)	210mmL x 35mmD x 81mmH
3 optional poles	11cm, 25cm, & 37cm (optional)
Dimension (base)	150mmL x 80mmD x 12.5mmH
Viewing angle	Max. 45°
Pitch angle	Max. 30°
Weight	About 0.8 Kg

### Overall Dimensions (VFD-1615B)

Dimension (panel)	220mmL x 45mmD x 110mmH
Dimension (support)	Telescopic pole from 270mm to 440mm
Dimension (base)	Rectangular base 188mmL x 85mmD x 23mmH or 12mm Height with 80mmOD
Viewing angle	Max. 45°
Pitch angle	Max. 360°
Weight	About 0.8 Kg

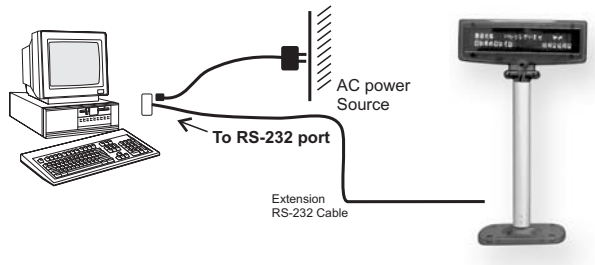
### Driver Interface

Driver interface	RS-232C
Driver command	ESC commands, EPSON compatible

## 2. Installation

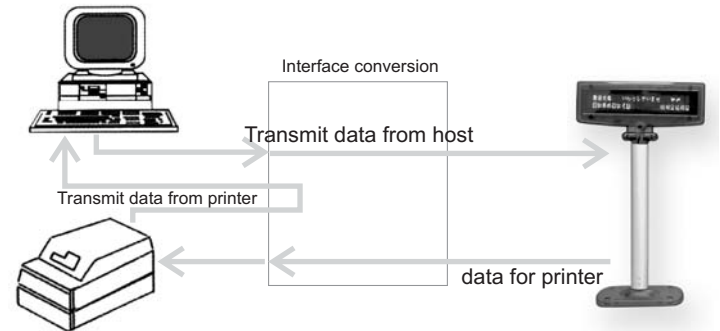
### A. RS-232 Connection:

- Step1: Power off the computer system.
- Step2: Connect the VFD 1615 Display Cable to the RS-232 Port of the computer.
- Step3: Proper set the connection between the bundled Power kit and the Switch power supply inside the computer or connecting the DC power source by the appropriate DC power Adapter.
- Step4: Turn on the computer, the VFD 1615 Display will show its default settings (Character set, Baud rate, page code, etc) and ready for receiving data



### B. Pass-through Connection:

- Step 1: Power off the computer, printer and display.
- Step 2: Please refer to the interface section of the manual for detailed information of the cable, and make proper connection to appropriate ports of the devices.
- Step 3: Power on the computer, printer and display.
- Step 4: The devices are ready for working.



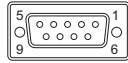
Note: All the data transmitted from Host will be processed by peripheral device selection command, then transmit the data to the proper devices, either the printer or the display.

### 3. Interfaces

#### A. RS-232 Cable-end

##### DSUB-9 Pin Female Connector

2	TX
3	RX
5	GND
7	CTS
8	RTS
9	VCC
1	] Short Connection
4	
6	



#### B. DC Power Jack



#### C. Pass-through Cable Pinouts:

##### CBL-VFD-PASS 1

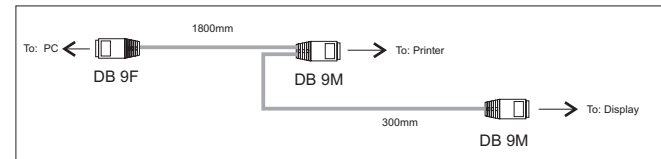
For the printer with ESC commands

To:Host	To:Printer	To:Display
DB9F	DB9M	DB9M
2 (RXD).....	2 (TXD)	
3 (TXD).....	3 (RXD)	3 (RXD)
4 (DTR).....	4 (DSR)	
5 (GND).....	5 (GND)	6 (RXD)
6 (DSR).....	6 (DTR)	
7 (RTS).....	7 (CTS)	
8 (CTS).....	8 (RTS)	

##### CBL-VFD-PASS 2

For the printer without ESC commands

To:Host	To:Printer	To:Display
DB9F	DB9M	DB9M
2 (RXD).....	2 (TXD)	
	3 (RXD)	3 (TXD)
3 (TXD).....		3 (RXD)
4 (DTR).....	4 (DSR)	
5 (GND).....	5 (GND)	5 (GND)
6 (DSR).....		6 (DTR)
7 (RTS).....	7 (CTS)	
8 (CTS).....	8 (CTS)	
	6 (DTR)	4 (DSR)



## 4. Installing Configuration Utility

Before running the bundled RS-232 setting software, please note the following default values:

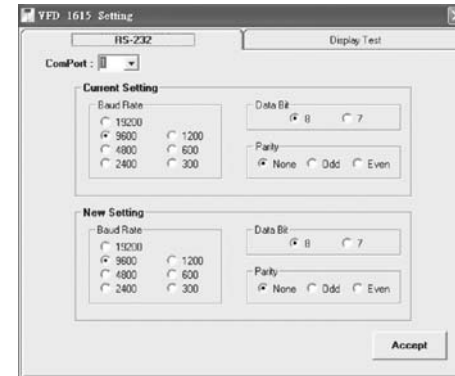
Com port: 1  
Baud rate: 9600  
Parity: none  
Data bit: 8

1. Insert the bundled CD disc into the CD-ROM drive
2. Run the "setup.exe" file from the disc.
3. Follow the installation hints until the installation process is fully completed.
4. Go "start menu" > "programs" > "VFD-1615" > "VFD1615" to begin the customer display configuration.

### RS-232 Setting:

Click the RS-232 tab (see pictures) from the menu to set the Com Port, Baud Rate, Data Bit and Parity setting.

Note: In order to successfully change to new settings, please check if the Current Setting on the utility program matches the actual current setting of VFD 1615 Display unit.



### When configuration is successfully done:

An "OK" message box will be shown on the monitor. Click it or press "enter" at the keyboard then the Display content will be cleared.

### When configuration isn't successfully done:

A "Device Time Out" message box will be shown on the monitor. Please do the configuration again or consult with your supplier for further assistance.

## 5. Control Code Set

HEX	CODE	HEX	CODE
00	NULL	0D	CR
01	Md1	1F 01	US MD1
02	Md2	1F 02	US MD2
03	Md3	1F 03	US MD3
08	BS	1F 0D	US CR
09	HT	1F 42	US B
0A	LF	1F 24	US \$
1F 0A	US LF	18	CAN
0B	HOM	1B 3D	ESC =
0C	CLR	1B 40	ESC @

## 6. ESC/POS Commands List

Command	Code description (Hex)	Function description
BS	08	Move cursor left
HT	09	Move cursor right
LF	0A	Move cursor down
US LF	1F 0A	Move cursor up
HOM	0B	Move cursor to home position
CR	0D	Move cursor to left-most position
US CR	1F 0D	Move cursor to right-most position
US B	1F 42	Move cursor to bottom position
US \$ n m	1F 24 n m 1 <= n (column) <= 20 m (line) = 1 or 2	Move cursor to specified position; nth column and mth line
CLR	0C	Clear display screen
CAN	18	Clear cursor line
ESC = n	1B 3D n 1 <= n <= 3	Select peripheral device
ESC @	1B 40	Initialize display
US MD1	1F 01	Specify overwrite mode
US MD2	1F 02	Specify vertical scroll mode
US MD3	1F 03	Specify horizontal scroll mode
ESC % n	1B 25 n 1 <= n <= 3	Select/cancel user-defined character set
ESC & s n m	1B 26 s n m s = 1, 32<=n <=m<=126	Define user-defined character set

<b>Command</b>	<b>Code description (Hex)</b>	<b>Function description</b>
ESC ? n	1B 3F n 32 <= n <= 126	Cancel user-defined characters
ESC R n	1B 52 n 0 <= n <= 13	Select an international character set
ESC t n	1B 74 n	Select character code table
ESC W n m	1B 57 n m 1 <= n <=4 M = 0, 1, 48, 49	Select/cancel window range
US C n	1F 43 n N = 0, 1, 48, 49	Select/cancel cursor display
US E n	1F 45 n 0 <= n <= 255	Set display screen blink interval
US T h m	1F 54 h m 0 <= h <= 23 0 <= m <= 59	Set and display time counter
US U	1F 55	Display time counter
US X n	1F 58 n 1 <= n <= 4	Brightness adjustment
US r n	1F 72 n n = 0,1,48,49	Select/cancel reverse characters
US v n	1F 76 n n = 0,1,48,49	Status confirmation by DTR signal
US @	1F 40	Execute self-test
US :	1F 3A	Start/end macro definition
US ^ n m	1F 5E n m 0 <= n <= 255 0 <= m <= 255	Execute and quit macro

## Command description:

### BS-Move cursor left

Command Name:	BS
Format:	ASCII BS Hex08 Decimal8
Description:	Moves the cursor one character position to the left.

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### HT-Move cursor right

Command Name:	HT
Format:	ASCII HT Hex 09 Decimal 9
Description:	Moves the cursor one character position to the right .

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### LF-Move cursor down

Command Name:	LF
Format:	ASCII LF Hex 0A Decimal 10
Description:	Moves the cursor down one line.

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### US LF-Move cursor up

Command Name:	US	LF
Format:	ASCII US LF Hex 1F 0A Decimal 31 10	
Description:	Moves the cursor up one line.	

### HOM-Move cursor to home position

Command Name:	HOM
Format:	ASCII HOM Hex 0B Decimal 11
Description:	Moves the cursor to the left-most position on the upper line (home position). Home position indicates the first column of the upper line.

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### CR-Move cursor to left-most position

Command Name:	CR
Format:	ASCII CR Hex 0D Decimal 13
Description:	Moves the cursor to the left-most position on the current line. The cursor is moved only within the current window.

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### US CR-Move cursor to right-most position

Command Name:	US	CR
Format:	ASCII US CR Hex 1F 0D Decimal 31 13	
Description:	Moves the cursor to the right-most position on the current line.	

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### US B-Move cursor to bottom position

Command Name:	US	B
Format:	ASCII US B Hex 1F 42 Decimal 31 66	
Description:	Moves the cursor to the bottom position.	

### US \$ n m-Move cursor to specified position

Command Name: US \$ n m  
Format: ASCII US \$ nm  
Hex 1F 24 nm  
Decimal 31 36 n m  
Range:  $1 \leq n \leq 20$   
 $m = 1 \text{ or } 2$   
Description: Moves the cursor to the nth column on the mth line. If a value exceeding the range is specified for n (column) and/or m (line), this command is ignored and the cursor doesn't move.

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### CLR-Clear display screen

Command Name: CLR  
Format: ASCII CLR  
Hex 0C  
Decimal 12  
Description: Clears all the displayed characters. After the command is executed, the cursor moves to the home position.

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### CAN-Clear cursor line

Command Name: CAN  
Format: ASCII CAN  
Hex 18  
Decimal 24  
Description: Clears the line containing the cursor. After this command is executed, the cursor moves to the left-most position on the current line.

### ESC = n-Select peripheral device

Command Name: ESC = n  
Format: ASCII ESC = n  
Hex 1B 3D n  
Decimal 27 61 n  
Range:  $1 \leq n \leq 3$   
Description: Selects the device(s) to which the host computer sends data, using the value(s) of n from the following table:

Bit	Off/On	Hex	Decimal	Function
0	Off(*)	00	0	Printer canceled.
	On	01	1	Printer selected.
1	Off	00	0	Display canceled.
	On	02	2	Display selected.
2 to 7	--	--	--	Undefined.

(\*):Default setting

Example: ESC = 0 Printer, Display are canceled.  
ESC = 1 Printer is selected.  
ESC = 2 Display is selected.  
ESC = 3 Printer, Display are selected.

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### ESC @-Initialize display

Command Name: ESC @  
Format: ASCII ESC @  
Hex 1B 40  
Decimal 27 64  
Description: Resets the various display settings to their initial values. The software settings are reset to their power-on values. The data in the receive buffer is not cleared

### US MD1-Select overwrite mode

Command Name:	US	MD1
Format:	ASCII	US MD1
	Hex	1F 01
	Decimal	31 1

Description: Selects overwrite mode as the screen display mode. In overwrite mode, entering a character code moves the cursor to the left end of the lower line when the cursor is at the right end of the upper line, and to the left end of the upper line when the cursor is at the right end of the lower line.

Notes: Selects overwrite mode cancels horizontal or vertical scroll mode.

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### CLR-Clear display screen

Command Name:	US	Md2
Format:	ASCII	US MD2
	Hex	1F 02
	Decimal	31 2

Description: Selects vertical scroll mode as the screen display mode. In vertical scroll mode, entering a character code moves the cursor to the left end of the lower line when the cursor is at the right end of the upper line, scrolls the characters displayed on the lower line to the upper line, and clears the lower line when the cursor is at the right end of the lower line.

Notes: Selects vertical scroll mode cancels horizontal or overwrite mode.

### US MD3-Select horizontal scroll mode

Command Name:	US	Md3
Format:	ASCII	US MD3
	Hex	1F 03
	Decimal	31 3

Description: Selects horizontal scroll mode as the screen display mode. In horizontal scroll mode, entering a character code scrolls all displayed characters one character to the left, then displays the new character at the right end.

Notes: Selects horizontal scroll mode cancels vertical scroll or overwrite mode.