

User's Manual

VFD-850 Series VFD Customer Display



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1. Information

1.1 Standard Package

- Display Unit
- Support CD
- Power Kit
to retrieve power DC 12V from switching power supply
inside the computer.

1.2 Optional Accessories

- Switch-Mode Power Supply
Input: AC 100V~240V, 50Hz~60Hz
Output: DC 9 V, 1A
- Power adapter
Input: AC 110V, 60Hz
Output: DC 9 V, 1A
- Power adapter
Input: AC 230V, 60Hz
Output: DC 9 V, 1A
- Optional fixed pole 300mm or 400mm
- Pass through cable

1.3 Specifications

A. Tube Display

Customer Display	Vacuum Fluorescent Display
Display Pattern	5 x 7 dot matrix
Brightness	700 cd/m ²
Character Type	96 alphanumeric & 13 international characters
Character Set	9 different command sets
Character Size	6.4W x 9.2H mm
Character Number	2 x 20

B. Electrical

Power Source	DC 9V~12V (RS-232)
Power Consumption	4.5 Watts (RS-232)
Central Control Unit	CPU 8032 ROM 64K flash ROM 32K SRAM
Speed	29MHz

C. Physical

Dimensions (Panel)	224W x 45D x 83H mm
Dimensions (Support)	Telescopic pole 270~440mm or optional fixed pole 300mm or 400mm

Dimensions (Base)	187W x 84D x 22H mm
Tilt Angle	Max. 53°
Rotation Angle	Max. 360°
Weight	About 0.8Kg
Interface	RS-232
Color	Black or beige

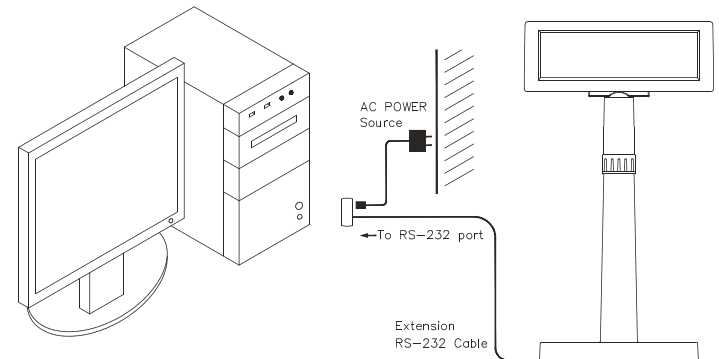
D. Environmental

Operating Temperature	0°C~40°C (32°F~104°F)
Storage Temperature	-10°C~50°C (14°F~122°F)
Relative Humidity	0%~90% RH

2. Installation

RS-232 Connection

- Step 1: Turn off the computer.
- Step 2: Connect the display cable to the RS-232 port of the computer.
- Step 3: 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.
- Step 4: Turn on the computer. The display will be on and ready for receiving data.

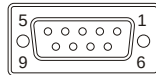


3. Interface

3.1 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	



3.2 DC Power Jack



GND —  — +500~1000mA 9~12VDC

3.3 Interface of Display Panel Side

· Specifications

Data Transmission method: Asynchronous Serial
 Default protocol: 9600 bps, non-parity,
 8 data bits, 1 stop bit

· Interface connector (display panel side)

6 pin Male-Header

Pin assignments:

1	TXD
	DSR
	RXD
	DTR
	GND
6	VCC

4. Character Font Table

A. Control code set

HEX	CODE	HEX	CODE
00H	NULL	10H	DLE
01H	MD1	11H	DC1
02H	MD2	12H	DC2
03H	MD3	13H	DC3
04H	MD4	14H	DC4
05H	MD5	15H	
06H	MD6	16H	
07H	MD7	17H	
08H	BS, Md8	18H	CAN
09H	HT	19H	
0AH	LF	1AH	
0BH	HOM	1BH	ESC
0CH	CLR	1CH	
0DH	CR	1DH	
0EH	SLE1	1EH	Sf1
0FH	RS,SLE2	1FH	US, Sf2

B. U.S.A. font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
20h																
30h																
40h																
50h																
60h																
70h																

C. International character selection

ASCII CODE

Hex. Value	International	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
30H	USA	0	1	2	3	4	5	6	7	8	9	A	B
31H	FRANCE	0	1	2	3	4	5	6	7	8	9	A	B
32H	GERMANY	0	1	2	3	4	5	6	7	8	9	A	B
33H	U.K.	0	1	2	3	4	5	6	7	8	9	A	B
34H	DENMARK I	0	1	2	3	4	5	6	7	8	9	A	B
35H	SWEDEN	0	1	2	3	4	5	6	7	8	9	A	B
36H	ITALY	0	1	2	3	4	5	6	7	8	9	A	B
37H	SPAIN	0	1	2	3	4	5	6	7	8	9	A	B
38H	JAPAN	0	1	2	3	4	5	6	7	8	9	A	B
39H	NORWAY	0	1	2	3	4	5	6	7	8	9	A	B
3AH	DENMARK II	0	1	2	3	4	5	6	7	8	9	A	B
3BH	SLAVONIC	0	1	2	3	4	5	6	7	8	9	A	B
3CH	RUSSIA	0	1	2	3	4	5	6	7	8	9	A	B

3DH: Standard Europe international font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
90h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
B0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
C0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
D0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
E0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
F0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

3EH: Multilingual international font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
90h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
B0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
C0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
D0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
E0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
F0h	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

3FH: Portuguese international font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
90h	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
A0h	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
B0h	ð	ñ	ò	ó	ô	õ	ö	×	ø	ù	ú	û	ü	ý	þ	ÿ
C0h																
D0h																
E0h																
F0h																

41H: NORDIC international font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
90h	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
A0h	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
B0h	ð	ñ	ò	ó	ô	õ	ö	×	ø	ù	ú	û	ü	ý	þ	ÿ
C0h																
D0h																
E0h																
F0h																

40H: Canadian French international font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
90h	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
A0h	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
B0h	ð	ñ	ò	ó	ô	õ	ö	×	ø	ù	ú	û	ü	ý	þ	ÿ
C0h																
D0h																
E0h																
F0h																

42H: RUSSIA font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
90h	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
A0h	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
B0h	ð	ñ	ò	ó	ô	õ	ö	×	ø	ù	ú	û	ü	ý	þ	ÿ
C0h																
D0h																
E0h																
F0h																

5. System Commands

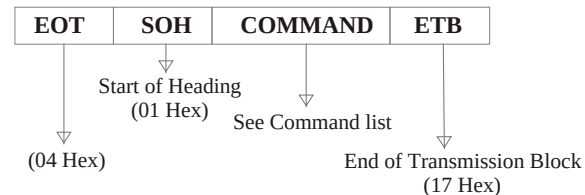
43H: SLAVONIC Font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h	0000	0001	0002	0003	0004	0005	0006	0007	0008	0009	000A	000B	000C	000D	000E	000F
90h	0010	0011	0012	0013	0014	0015	0016	0017	0018	0019	001A	001B	001C	001D	001E	001F
A0h	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F
B0h	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F
C0h	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F
D0h	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F
E0h	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F
F0h	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F

44H: Katakana font set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F
90h	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F
A0h	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF
B0h	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF
C0h	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF
D0h	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF
E0h	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF
F0h	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF

5.1 Command Format



5.2 Command List

A. Set Baud Rate

COMMAND: B

COMPUTER: EOT SOH 'B' 'BAUD RATE' 'N' ETB
 ASCII (04H)(01H)(42H) (31H~37H)(4EH)(17H)

Byte 1 1 1 1 1 1
 DISPLAY: ACK (or NACK if failed)

ASCII (06H) (15H)
 Byte 1 1

Note: Baud rates

31H: 9600
 32H: 4800
 33H: 2400
 34H: 1200
 35H: 600
 36H: 300
 37H: 19200

B. Select international code table

```
COMMAND: I
COMPUTER:EOT SOH 'I' 'CHAR' ETB
      ASCII(04H)(01H)(49H)(30H~44H)(17H)
      Byte 1 1 1 1 1
DISPLAY: ACK (or NACK if failed)
      ASCII (06H) (15H)
      Byte 1 1
```

Note : International Character Code

30H : U. S. A.	3BH : Slavonic
31H : France	3CH : Russia
32H : Germany	3DH : Standard Europe International font set
33H : U. K.	3EH : Multilingual International font set
34H : Denmark I	3FH : Portuguese International font set
35H : Sweden	40H : Canadian French International font set
36H : Italian	41H : Nordic International font set
37H : Spain	42H : Russia font set
38H : Japan	43H : Slavonic font set
39H : Norway	44H : Katakana font set
3AH : Denmark II	

C. Save the current view message

(Save Demo view data)

```
COMMAND: S
COMPUTER:EOT SOH 'S' 'Layer' ETB
      ASCII(04H)(01H)(53H)(31H~33H)(17H)
      Byte 1 1 1 1 1
DISPLAY: ACK (or NACK if failed)
      ASCII (06H) (15H)
      Byte 1 1
```

Note : 31H: Layer 1 / 32H: Layer 2 / 33H: Layer 3

D. Set cursor position

```
COMMAND: P
COMPUTER:EOT SOH 'P' 'Position' ETB
      ASCII (04H) (01H) (50H) (31H~58H) (17H)
      Byte 1 1 1 1 1
DISPLAY: ACK (or NACK if failed)
      ASCII (06H) (15H)
      Byte 1 1
```

Note: The cursor can be set to the position from 1 to 40
Position 1 means the upper left corner position.
Position 20 means the upper right corner position.
Position 21 means the lower left corner position.
Position 40 means the lower right corner position.

E. Clear display range

COMMAND: C
COMPUTER: EOT SOH 'C' 'START' 'END' ETB
ASCII (04H)(01H)(43H)(31H~58H)(31H~58H)(17H)
Byte 1 1 1 1 1 1
DISPLAY: ACK (or NACK if failed)
ASCII (06H) (15H)
Byte 1 1

Note: Some part of the current view messages can be cleared by this COMMAND. It can start clearing between position 1 and position 40.

F. Display the saved DEMO message

COMMAND: D
COMPUTER: EOT SOH 'D' 'Layer' 'Mode' ETB
ASCII (04H)(01H)(44H)(31H~37H)(31H~33H)(17H)
Byte 1 1 1 1 1 1
DISPLAY: ACK (or NACK if failed)
ASCII (06H) (15H)
Byte 1 1

Note:

- a) There are three layers of saved view messages as described on COMMAND "S"
- b) There are two modes of display:
Mode 1 is running the saved messages from right to left, which is a horizontal scroll mode.
Mode 2 is running the saved messages from the lower line to the upper line, which is a vertical scroll mode.
- c) For display layers:
select 31H means display the message saved on layer 1.
select 32H means display the message saved on layer 2.
select 33H means display the message saved on layer 1+ layer 2.
select 34H means display the message saved on layer 3.
select 35H means display the two messages saved on layer 1 + layer 3.
select 36H means display the two messages saved on layer 2 + layer 3.
select 37H means display all the messages saved on layer 1 + layer 2 + layer 3.
- d) For display modes,
select 31H means display the message with Mode 1.
select 32H means display the message with Mode 2.
select 33H means display the message with Mode 1+Mode 2.
For this Demo display function, you must have saved the message by COMMAND "S" previously, For example, select 37H for displaying layers and select 33H for displaying modes, DSP would display all the three messages saved on layer 1+ layer 2 + layer 3 with both Mode 1 + Mode 2 displaying modes.
- E) Any new message from the computer would stop this Demo display function and DSP would display that new message from the computer.

G. Select the Command Mode

COMMAND: M
COMPUTER: EOT SOH 'M' 'Mode' ETB
ASCII (04H) (01H) (4DH)(30H~38H) (17H)
Byte 1 1 1 1 1
DISPLAY: ACK (or NACK if failed)
ASCII (06H) (15H)
Byte 1 1

Note: Command Modes Selection

30H : VFD-450	35H : ICD 2002
31H : EPSON ESC/POS	36H : CD 5220
32H : UTC/S	37H : DSP-800
33H : UTC/E	38H : ADM 787/788
34H : AEDEX	

H. Set all default

COMMAND: X
COMPUTER: EOT SOH 'X' ETB
ASCII (04H) (01H) (58H) (17H)
Byte 1 1 1 1

5.3 Transmission method

Each ASCII character is transmitted with

1 start bit
8 data bits
1 stop bit
No parity

Note: You may generate your own application software to run the display according to the standard RS-232C communication protocols and the SOFTWARE CONTROL information listed on this chapter.

6. Demo Software

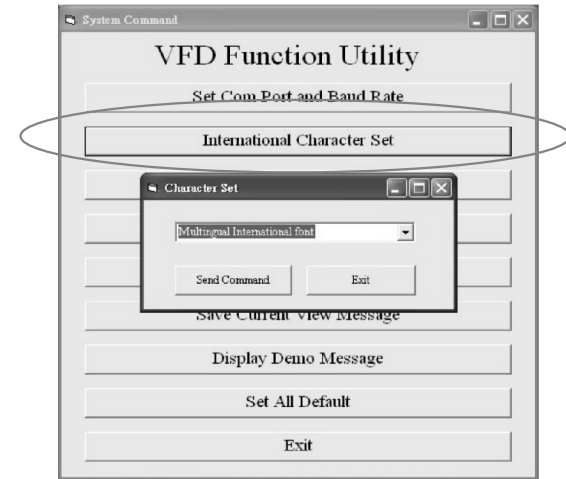
Connect the display to the COM 1 of the computer. The default communication parameters of the display are:

COM port: COM 1
Baud rate: 9600
Parity: None
Data bits: 8
Stop bit: 1

- Make sure the display is powered on and connected properly to the computer.
- Insert the bundled CD and install the demo software through Utilities\VFD-450&550&650\setup.exe
- Run the demo software through Start\Programs\vfd2003.
- Test the software commands, such as Cursor Position, Screen Display, and Display Mode, by each index.
- Close the configuration utility to complete the setup process.

Note: Set the symbol of the Euro (€)

- Run the demo software of VFD-850.
- Click "International Character Set" and select "Multilingual international font". Press the "Send Command" button on the Character Set window.



- The position of the Euro (€) is Font: E, D5 (Hex).

7. Command List

The command modes can be selected with the Demo Software.

Mode 0: VFD-450 (Default)
 Mode 1: EPSON Esc/POS
 Mode 2: UTC Standard
 Mode 3: UTC Enhanced
 Mode 4: AEDEX
 Mode 5: ICD 2002
 Mode 6: CD 5220
 Mode 7: DSP-800
 Mode 8: ADM 787/788

Mode 0: VFD-450 mode

Command	Hexadecimal Codes	Function
B	42H	Set baud rate and parity
I	49H	Select international character set
S	53H	Save the current view message
P	50H	Set cursor position
C	43H	Clear display message
D	44H	Display the saved DEMO message
ESC G	IBH 47H	Print ON command
ESC S	IBH 53H	Print OFF command
M	4DH	Select command mode
X	58H	Set all default

Mode 1: EPSON Esc/POS mode

Command	Code Description (hex)	Function
HT	09	Move cursor right
BS	08	Move cursor left
US LF	1F 0A	Move cursor up
LF	0A	Move cursor down
US CR	1F 0D	Move cursor to right-most position
CR	0D	Move cursor to left-most position
HOM	0B	Move cursor to home position
US B	1F 42	Move cursor to bottom position
US \$ x y	1F 24 x y X=1-20 y=01,02	Move cursor to specified position
CLR	0C	Clear display screen
CAN	18	Clear cursor line
US E n	1F 45 n n=00-ff	Blink display screen
ESC @	1B 40	Initialize display
ESC R n	1B 52 n n=0~15	Select international character set
US MD1	1F 01	Specify overwrite mode
US MD2	1F 02	Specify vertical scroll mode
US MD3	1F 03	Specify horizontal scroll mode
ESC W n s x1 y1 x2 y2	1B 57 n s x1 y1 x2 y2 n=1,2,3,4 s=0, 1	Specify/cancel the window range 1<=x1<=x2<=20 1<=y1<=y2<=2
US:	1F 3A	Set starting/ending position of macro definition
US ^ n m	1F 5E n m 00<=(n,m)<=ff	Execute and quit macro

Command	Code Description (hex)	Function
US @	1F 40	Execute self-test
US T h m	1F 54 h m 0<=h<=17, 0<=m<=3b	Display time
US U	1F 55	Display time continuously
US.n	1F 2E n	n= a displayable character code Display the code with a dot
US,n	1F 2C n	n= a displayable character code Display the code with a comma
US;n	1F 3B n	n= a displayable character code Display the code with a semicolon
US#nm	1F 23 n m n = 0 ro 1 0 <=m<=20	Turn the anuciator (▼) ON/OFF

Mode 2: UTC Standard mode

Command	Code Description (hex)	Function
BS	08	Back space
HT	09	Horizontal tab
LF	0A	Line feed
CR	0D	Carriage return
DLE	0F	Display position
DC1	11	Over write display mode
DC2	12	Vertical scroll mode
DC3	13	Cursor on
DC4	14	Cursor off
ESC d	1B 64	Change to UTC enhanced mode
US	1F	Clear display

Mode 3: UTC enhanced mode

Command	Code Description (hex)	Function
ESC u ACR	1B 75 41 [data x 20] 0D	Upper line display
ESC u BCR	1B 75 42 [data x 20] 0D	Bottom line display
ESC u DCR	1B 75 44 [data x 20] 0D	Upper line message scroll continuously
ESC u ECR	1B 75 45 hh ':' mm 0D H,m='0'-'9'	Display time
ESC u FCR	1B 75 46 [data x 20] 0D	Upper line message scroll once pass
ESC u HCR	1B 75 48 n m 0D 20h<=n,m	Change attention code
ESC u ICR	1B 75 49 [data x 40] 0D	Two line display
ESC RS CR	1B 0F 0D	Change to UTC standard mode

Mode 4: AEDEX mode

Command	Code Description (hex)	Function
! # 1CR	21 23 31 [data x 20] 0D	Upper line display
! # 2CR	21 23 32 [data x 20] 0D	Bottom line display
! # 4CR	21 23 34 [data x 20] 0D	Upper line message scroll continuously
! # 5CR	21 23 35 hh ':' mm 0D H,m='0'-'9'	Display time
! # 6CR	21 23 36 [data x 20] 0D	Upper line message scroll once pass
! # 8CR	21 23 38 n m 0D 20h<=n,m	Change attention code
! # 9CR	21 23 39 [data x 40] 0D	Two line display
! # ACR	21 23 41 [data x 20] 0D	Upper line scroll message
! # BCR	21 23 42 [data x 20] 0D	Bottom line display message

Mode 5: ICD 2002 mode

Command	Code Description (hex)	Function
HT	09	Move cursor right (only valid in overwrite mode)
BS	08	Move cursor left (only valid in overwrite mode)
CR	0D	Move cursor to left-most position (only valid in overwrite mode)
ESC @	1B 40	Initialize customer display to initial state, clears display buffer, set display mode to shift and sets current display row to upper row
ESC U	1B 55	Select upper row as current row (initial default)
ESC D	1B 44	Select lower row as current row
ESC A ϕ	1B 41 ϕ	Sets customer display disable or enable ϕ 'D'=disable, 'E'=enable
ESC C r c	1B 43 r c	Move cursor to specified position (only valid in overwrite mode) -r Row ('U'=upper,'D'=lower) -c Column number (range from 1~20)
ESC E r ϕ	1B 45 r ϕ	Set special effect or display mode of specified row
ESC R n	1B 52 n n=30~44	Set international font sets -n international fonts code

REMARK)* Using command "ESC E r ϕ ", the value of parameter:

r 58= all rows
55= upper row
44= lower row

ϕ special function, the value is one of
30= shift mode (default)
31= rotation mode
32= blink mode
33= clear this row and switch to shift mode
34= overwrite mode
35= vertical mode

Mode 6: CD 5220 standard mode

Command	Code Description (hex)	Function
ESC DC1	1B 11	Overwrite mode
ESC DC2	1B 12	Vertical scroll mode
ESC DC3	1B 13	Horizontal scroll mode
ESC Q A...CR	1B 51 41 [n]x20 0D	Set the string display mode, write string to upper line
ESC Q B...CR	1B 51 42 [n]x20 0D	Set the string display mode, write string to lower line
ESC Q D...CR	1B 51 44 [n]x20 0D	Upper line message scroll continuously
ESC [D	1B 5B 44	Move cursor left
BS	08	Move cursor left
ESC [C	1B 5B 43	Move cursor right
HT	09	Move cursor right
ESC [A	1B 5B 41	Move cursor up
ESC [B	1B 5B 42	Move cursor down
LF	0A	Move cursor down
ESD [H	1B 5B 48	Move cursor to home position
HOM	0B	Move cursor to home position
ESC [L	1B 5B 4C	Move cursor to left-most position
CR	0D	Move cursor to left-most position
ESC [R	1B 5B 52	Move cursor to right-most position

Command	Code Description (hex)	Function
ESC [K	1B 5B 4B	Move cursor to bottom position
ESC 1 x y	1B 6C x y 1<=x<=20, y=1,2	Move cursor to specified position
ESC @	1B 40	Initialize display
ESC W s x1 x2 y	1B 57 1 x1 x2 y 1<=x1<=x2<=20 Y=1,2	Set or cancel the window range at horizontal scroll mode
CLR	0C	Clear display screen, and Clear string mode
CAN	18	Clear cursor line, and clear string mode
ESC _ n	1B 5F n n=0,1	Set cursor ON/OFF
ESC f n	1B 66 n n=30~44	Select international fonts set

30H : U. S. A.	3BH : Slavonic
31H : France	3CH : Russia
32H : Germany	3DH : Standard Europe International font set
33H : U. K.	3EH : Multilingual International font set
34H : Denmark I	3FH : Portuguese International font set
35H : Sweden	40H : Canadian French International font set
36H : Italian	41H : Nordic International font set
37H : Spain	42H : Russia font set
38H : Japan	43H : Slavonic font set
	44H : Katakana font set

Mode 7: DSP-800 mode

Command	Code Description (hex)	Function
EOT SOH I n ETB	04 01 49 n 17	Select international fonts set
EOT SOH P n ETB	04 01 50 n 17 n=31H-58H	Move cursor to specified position
EOT SOH C n m ETB	04 01 43 n m 17 31H≤n≤m≤58H	Clear display range from n position to m position and move cursor to n position
EOT SOH S n ETB	04 01 53 n 17 n=31H-35H	Save the current displaying data to n layer for demo display
EOT SOH D n m ETB	04 01 44 n m 17 n=31H-4FH m=31H-33H	Display the saved data
EOT SOH T ETB	04 01 54 17	Transmit the current view message to computer
EOT SOH B n N ETB	04 01 42 n 4E 17 n=31H: 9600 n=32H: 4800 n=33H: 2400 n=34H: 1200 n=35H: 600 n=36H: 300	Set baud rate

Mode 8: ADM 787/788 mode

Command	Code Description (hex)	Function
CLR	0C	Clear display
CR	0D	Carriage return
SLE1	0E	Clear upper line and move cursor to upper left-end position
SLE2	0F	Clear bottom line and move cursor to bottom left-end position
DC0	10 n	Set period to upper line, last n position 31h<n<37h
DC1	11 n	Set line blinking, upper line n='1', bottom line n='2'
DC2	12 n	Clear line blinking, upper linen='1', bottom line n='2'
SF1	1E	Clear field 1 and move cursor to field 1, first position
SF2	1E	Clear field 2 and move cursor to field 2, first position