DSP840 Operation Manual
Version 3.0

Contents

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1. INFORMATION

Model DSP840

A. Standard package:

1.Display main unit	**1 pc**
2.Base stand with I/O interface board	**1 pc**
3.Power plug cable for power source	**1 pack**
4.Interface cable for computer	**1 pc**
5.Poles upper and lower	**2 pcs**

B. Optional accessories:

1. Power supply adaptor DC 12V/120VAC
2. Power supply adaptor DC 12V/230VAC
3. Interface cable for printer

C. Model Classification

DSP840 B - 00 E
①   ②   ③   ④

①**Model number: DSP840 →Single Face**
                DSP842 →Double Face
②**Version: B→White**
               D→Dark Gray
③Type: 00→standard type
④**Adaptor Type: none→no adaptor**
                     U→120VAC/12VDC adaptor
                     E→230VAC/12VDC adaptor
                     J→100VAC/12VDC adaptor

> This device complies with Part 15 of the FCC . Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2. INTRODUCTION

DSP840 Customer Display is an artistic design POS system peripheral device. It is for use with ECR, POS system to display the purchased prices and the amount of change to customers. Also it is capable to display the advertising message.

The major features of DSP840 are:
A. Displays up to 40 characters (20 columns x 2 lines).
B. Large font (9 x 5.25mm) is easy to read.
C. The vacuum fluorescent display (VFD) provides a wide viewing angle, long life, high reliability and high display quality.
D. The blue-green display color is gentle to the eyes.
E. The display panel is adjustable to provide the best viewing angle.
F. Provides good general utilities:
    User-defined message can be downloaded.
    International character sets.
    Advertising message running.
G. Provides an interface based on RS-232C with baud rate selectable from 300 to 19200 BPS.
H. Built-in connector with Serial POS-Printers. This means that you need only one com-port to control both display and printer.

3. INSTALLATION

A. If you could get the power source DC 12V from the computer(POS system), you might use the enclosed "Power Plug Cable" pack.

   1. **Turn off the power of the computer(POS system).**
   2. **Connect the power plug cable with the power source(DC 12V) inside the computer(POS system) and secure the RCA jack bracket on the rear panel of the computer(POS system).**
   3. **Remove screws to open the bottom cover of the base stand of the DSP840 to find the interface board inside.**
   4. **Connect the RCA jack with the DC power jack on the DSP840 receptacle by using the RCA plug--DC plug adaptor cable.**
   5. **Connect the DB25(female) connector with "Interface cable for computer" to the computer(POS system).**
   6. **Connect the DB9(male) connector with "Interface cable for printer"(optional) to the aux-device(printer) when you need this optional printer feature.**
   7. **Mount the bottom cover of the base stand.**
   8. **Turn on the power of the computer(POS system). The display will be ON.**

B. If you are using the external power-supply adaptor DC 12V(Option).

   1. **Turn off the power of the computer(POS system).**
   2. **Remove screws to open the bottom cover of the base stand of the DSP840 to find the interface board inside.**
   3. **Connect the D-sub 25 pin connector with "Interface cable for computer" to the computer(POS system).**
   4. **Connect the power supply unit with the DC power jack on the DSP840 receptacle.**
   5. **Connect the DB9(male) connector with "Interface cable for printer"(optional) to the aux-device(printer) when you need this optional printer feature.**
   6. **Mount the bottom cover of the base stand.**
   7. **Turn on the computer(POS system) and the power supply unit. The display will be ON.**
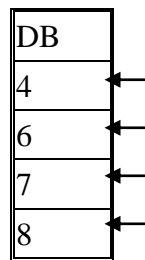
4. PIN ASSIGNMENT

A. DB-25(female) pin

Pin#	Signal
2	TXD
3	RXD
7	GROUND
5	CTS
4	RTS
20	DTR
6	DSR

B. DB-9(male) pin

Pin#	Signal
2	RXD
3	TXD
5	GROUND
7	RTS
8	CTS
6	DSR
4	DTR

C. Dummy Plug

DB	
4	
6	
7	
8	

D. DC power jack

Pin#	Signal
Center	+12VDC
Outer	GROUND

Note: Dummy Plug put on the aux-device (printer) connector is to do handshaking while aux-device(printer) did not exist. If you want to connect the aux-device printer, remove the Dummy Plug.
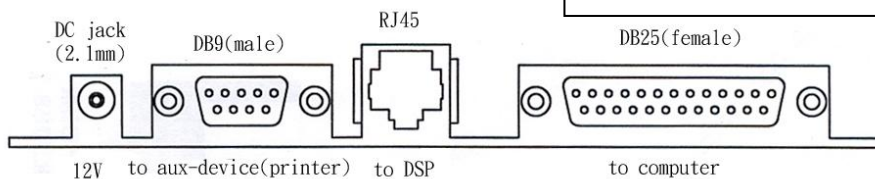
I/O Interface Board inside Base Stand

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5. DIP SWITCH SETTING

DSP840 has memory to keep your setting.

SW1~3	3	2	1	Baudrate setting	SW4~7	7	6	5	4	National Character set
	0	0	0	19.2K		0	0	0	0	U.S.A.
	0	0	1	9.6K		0	0	0	1	France
	0	1	0	4.8K		0	0	1	0	Germany
	0	1	1	2.4K		0	0	1	1	U.K.
	1	0	0	1.2K		0	1	0	0	Denmark I
	1	0	1	600		0	1	0	1	Sweden
	1	1	0	38.4K		0	1	1	0	Italy
	1	1	1	19.2K		0	1	1	1	Spain
SW8	0		Start-Up settings from memory		1	0	0	0	Japan
	1		Start-Up settings from DIP SW1~7 setting, also keep into memory		1	0	0	1	Norway
SW9,10	9	10	Command Group		1	0	1	0	Denmark I
	0	0	Automatic Command Group Recognition		1	0	1	1	East Europe
	1	0	GROUP A (DSP800 command sets)		1	1	0	0	Russian
	0	1	GROUP B (DM-D210 command sets)		1	1	0	1	Hebrew
	1	1	GROUP C (CD5220 command sets)		1	1	1	0	Greek
					1	1	1	1	U.S.A.

Remark:

A. 0 means DIP switch is at OFF position.

   1 means DIP switch is at ON position.

B. SW8 setting

   1. When SW8 is set to ON "1" position, the DSP840 would start up under the DIP switch setting conditions of Baud-Rate and Character-Set from SW1~7, and also these DIP switch setting conditions would be kept into memory of DSP840.

   2. When SW8 is set to OFF "0" position, the DSP840 would start up under the conditions of Baud-Rate and Character-Set from its memory.

C. **You must turn off the DSP840 power supply when you are doing DIP Switch Setting.**

D. **Command Group for SW9,10. Please refer to paragraph 7 for Command Group.**

ATTENTION:

When the Command Group DIP Switch 9,10 is set in "Automatic Command Group Recognition" mode (SW9,10 at OFF/OFF position) and you found you have display message-loss problem due to display output too slow, you can change the SW9,10 setting to the correct Command Group (Group A or Group B or Group C) you are using. This will solve the problem.

6. CHARACTER TABLES

International character code tables

Table 1(U.S.A.)

Table 2 International character difference among countries, others are as the same as Table 1.

	Country name	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	U.S.A	#	$	@	[	\	]	^	`	{	|	}	~
1	France	#	$	à	°	ç	§	^	`	é	ù	è	¨
2	Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3	U.K.	£	$	@	[	\	]	^	`	{	|	}	~
4	Denmark I	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain	₧	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
8	Japan	#	$	@	[	¥	]	^	`	{	|	}	~
9	Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark II	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11	East Europe	#	$	@	[	\	]	^	`	{	|	}	~
12	Russian	#	$	@	[	\	]	^	`	{	|	}	~
13	Hebrew	#	$	@	[	\	]	^	`	{	|	}	~
14	Greek	#	$	@	[	\	]	^	`	{	|	}	~

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Table 3(Japan)

Table 4(Hebrew)

Table 5 CodePage852 (East Europe)

Table 6(Russian)

Table 7 Greek

Table 8(page 3)

Table 9(page 4)

Table 10(page 5)

Table 11(page 17)

Table 12(page 18)

Table 13(page 19)

Table 14(page 255)

7. SOFTWARE CONTROL: COMMAND GROUP

Command symbols definitions are as below:

```
EOT     04H
SOH     01H
ETB     17H
ESC     1BH
US      1FH
ACK     06H
NACK    15H
```

Precaution to the Application Software Programmers:

1. DSP840 supports 3 groups of command. Each group has its own command sets. You must select one of the 3 groups by DIP SW9,10. Do not mix up command sets across groups when you are programming application software. This means you only can use the same one group of command sets for programming your application software.
2. When you select "Automatic Command Group Recognition" by DIP SW9,10. The DSP840 has only 250 bytes RAM spaces for keeping commands/data messages from the host before the DSP840 has done the previous command/data messages. Should your application software send a long string of commands/data messages to DSP840, the commands/data messages must not exceed total 250 bytes each time and it should hold a time delay at least 800ms and then send next commands/data messages to avoid losing characters on display. **Of course, If you set the DIP SW9,10 to match the Command Group you are using, it will catch up the speed.**

Group A. (DSP800 command sets)

A1. Package Command Format

EOT	SOH	COMMAND	ETB

Command List

Command	Hexadecimal	Description
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
T	54H	Transmit the current view message to computer
V	56H	Query the version of firmware
O	4FH	Set stay-message or running-message on display

Note: DSP840 will reply, after receive these commands.

A2. ESC Command Format

ESC	COMMAND

Command List

Command	Hexadecimal	Description
G	47H	Enable AUX-DEVICE (Printer)
S	53H	Disable AUX-DEVICE (Printer)

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Group B. (DM-D210 command sets)

B1. ESC Command Format

| ESC | COMMAND |

Command	Hexadecimal	Description
=	3DH	Selection of peripheral device
@	40H	Initialization of a display
R	52H	Selection of an international character set
t	74H	Selection of a character code table

B2. US Command Format

| US | COMMAND |

Command	Hexadecimal	Description
MD1	01H	Specify over-write mode
MD2	02H	Specify vertical scroll mode
MD3	03H	Specify horizontal scroll mode
C	43H	Specify / Release of a cursor Display
E	45H	Blink display screen
r	72H	Reversed character setting / cancel
@	40H	Execute self-test
LF	0AH	Move cursor up
CR	0DH	Move cursor to right-most position
B	42H	Move cursor to bottom position
$	24H	Move cursor to specified position

B3. Control Command Format

Symbol	Hexadecimal	Description
BS	08H	Move cursor left
HT	09H	Move cursor right
LF	0AH	Move cursor down
HOM	0BH	Move cursor to home position
CR	0DH	Move cursor to left-most position
CLR	0CH	Clear screen
CAN	18H	Clear cursor line

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Group C. (CD5220 Command sets)

DSP840 is also capable to execute CD5220 command format.

Command	Hexadecimal	Description
ESC DC1	1BH 11H	Specify over-write mode
ESC DC2	1BH 12H	Specify vertical scroll mode
ESC DC3	1BH 13H	Specify horizontal scroll mode
ESC [D	1BH 5BH 44H	Move cursor left
ESC [C	1BH 5BH 43H	Move cursor right
ESC [A	1BH 5BH 41H	Move cursor up
ESC [B	1BH 5BH 42H	Move cursor down
ESC [H	1BH 5BH 48H	Move cursor to home position
ESC [L	1BH 5BH 4CH	Move cursor to left-most position
ESC [R	1BH 5BH 52H	Move cursor to right-most position
ESC [K	1BH 5BH 4BH	Move cursor to bottom position
ESC l x y	1BH 6CH x y	Move cursor to specified position
ESC @	1BH 40H	Initialization of a display
CLR	0CH	Clear screen
CAN	18H	Clear cursor line
ESC _ n	1BH 5FH n	Specify / Release of a cursor Display
ESC f n	1BH 66H n	Selection of an international character set
ESC = n	1BH 3DH n	Selection of peripheral device

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A. Group A Command Instructions (DSP800 command sets)

A1-1. Set Communication Baud-Rate & Parity

ASCII	EOT	SOH	B	baudrate	parity	ETB
HEX	04H	01H	42H	n	p	17H

[Description]

You can set communication parameter by this command.

[Parameter]

baudrate	38400	600	1200	2400	4800	9600	19200
n	36H	35H	34H	33H	32H	31H	30H

p='N' means "non-parity, 8 data bits, 1 stop bit"

p='O' means "odd-parity, 7 data bits, 1 stop bit"

p='E' means "even-parity, 7 data its, 1 stop bit"

[Reply]   DSP840 reply **ACK**(06H) when correct or **NACK**(15H) when failed.

[Default] **baudrate**=19200, **non**-parity, **8** data bits, **1** stop bit.

A1-2. Select international code table

ASCII	EOT	SOH	I	country	ETB
HEX	04H	01H	49H	n	17H

[Description]

You can set one of international code table as character table for displaying. The same position in different international code table may be different. So, please refer **6. CHARACTER TABLES** to select correct code table.

[Parameters]

country	U.S.A.	France	Germany	U.K.	Denmark I	Sweden	Italy	Spain
n	30H	31H	32H	33H	34H	35H	36H	37H
country	Japan	Norway	Denmark II	East Europe	Russian	Hebrew	Greek	
n	38H	39H	3AH	3BH	3CH	3DH	3EH	

[Reply]   DSP840 reply **ACK**(06H) when correct or **NACK**(15H) when failed.

[Default] **country**=U.S.A.

A1-3. Save the current view-message as advertising message

ASCII	EOT	SOH	S	layer	ETB
HEX	04H	01H	53H	31H≦n≦33H	17H

[Description]

DSP840 is capable to save 3 layers of advertising messages. Each layer can have 40 characters. This commands save the current view-message as one of 3 layers. DSP840 demonstrate these layer-messages when execute **A1-6** command.

[Parameters]

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n=31H, means the current view-message saved to layer1 advertising message

n=32H, means the current view-message saved to layer2 advertising message

n=33H, means the current view-message saved to layer3 advertising message

[Reply]   DSP840 reply **ACK**(06H) when correct or **NACK**(15H) when failed.

A1-4. Set cursor position

ASCII	EOT	SOH	P	position	ETB
HEX	04H	01H	50H	31H≦**p**≦58H	17H

[Description]

You can locate cursor by this command. The position is regarded as linear.

[Parameters]   The cursor can be set to the position from 1 to 40.

Position 1(**p**=31H) means the upper-left corner position.

Position 20(**p**=44H) means the upper-right corner position.

Position 21(**p**=45H) means the lower-left corner position.

Position 40(**p**=58H) means the lower-right corner position.

[Reply]   DSP840 reply **ACK**(06H) when correct or **NACK**(15H) when failed.

A1-5. Clear specific display area

ASCII	EOT	SOH	C	start position	end position	ETB
HEX	04H	01H	43H	31H≦**p1**≦58H	31H≦**p2**≦58H	17H

[Description]

Specific part of the current view messages can be cleared by this command.

[Parameters]   **p1** and **p2** range same as **A1-4 Parameters**.

[Reply]   DSP840 reply **ACK**(06H) when correct or **NACK**(15H) when failed.

A1-6. DEMO the saved advertising message

ASCII	EOT	SOH	D	layer	mode	ETB
HEX	04H	01H	44H	31H≦**l**≦37H	31H≦**m**≦37H	17H

[Description]

1. There are three layers of saved advertising messages as described on **A1-3**.
2. There are three modes of display.

    mode1 is running the saved messages from right to left, which is a horizontal scroll mode.

    mode2 is running the saved messages from the lower line to the upper line, which is a vertical scroll mode.

    mode3 is displaying the saved messages with blinking.

3. For display layers,

    l=31 H means display the message saved on layer1.

    l=32H means display the message saved on layer2.

    l=33H means display the message saved on layer3.

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l=34H means display the two messages saved on layer1 + layer2.

l=35H means display the two messages saved on layer1 + layer3.

l=36H means display the two messages saved on layer2 + layer3.

l=37H means display all the three messages saved on layer1+layer2+ layer3.

4. For display modes,

   m=31 H means display the message with mode1. (horizontal scroll mode)

   m=32H means display the message with mode2. (vertical scroll mode)

   m=33H means display the message with mode3. (blinking mode).

   m=34H means display the message with both mode1 + mode2.

   m=35H means display the message with both mode1 + mode3.

   m=36H means display the message with both mode2 + mode3.

   m=37H means display the message with all modes, mode1+mode2+mode3. For this Demo display function, you must have saved the messages by "save the current view message" previously. For example, **l**=37H for displaying layers and **m**=34H for displaying modes, DSP840 would display all the three messages saved on layer1 + layer2 + layer3 with both mode1 + mode2 displaying modes.

5. Any new message from the computer would stop this Demo display function and DSP840 would display that new message from the computer.

[Reply]   DSP840 reply **ACK**(06H) when correct or **NACK**(15H) when failed.

A1-7. Transmit the current view message to computer

ASCII	EOT	SOH	T	ETB
HEX	04H	01H	54H	17H

[Description]

   You can get the current view message (40 characters) from DSP840.

[Reply]   The DSP840 reply current view message by following format

ASCII	SOH	current view message	ETB
HEX	01H	XXXX(40 characters)	17H

   or **NACK**(15H) when fail.

A1-8. Query the version of firmware

ASCII	EOT	SOH	V	ETB
HEX	04H	01H	54H	17H

[Description]   You can get the version of firmware.

[Reply]   The DSP840 reply current version of firmware

A1-9. Set stay-message or running-message on display

ASCII	EOT	SOH	O	n	ETB
HEX	04H	01H	4FH	30H/31H	17H

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[Description]   **n**=30H, The DSP840 will display stay-message from saved layer after you power on.

        n=31H, The DSP840 will display running-message from saved layer after you power on.

[Reply]   DSP840 reply **ACK**(06H) when correct or **NACK**(15H) when failed.

A2-1. Enable AUX-DEVICE (printer)

ASCII	ESC	G
HEX	1BH	47H

[Description]

    You can enable the aux-device (printer). After execute this command, all messages will pass through aux-device, and DSP840 doesn't care it. Besides **B1-1 & B1-2.**

A2-2. Disable AUX-DEVICE (printer)

ASCII	ESC	S
HEX	1BH	53H

[Description]

    You can disable the aux-device (printer). After execute this command, all messages will not pass through aux-device

B. Group B Command Instructions (DM-D210 command sets)

B1-1. Selection of peripheral device(Aux-device)

ASCII	ESC	=	peripheral
HEX	1BH	3DH	**n**

[Description]

1. When the aux-device(printer) is selected, all the data from the host computer is transmitted to the aux-device via the display.

2. When the display is selected, all the data from the host computer is processed internally in the display. And no data is transmitted to the aux-device.

3. When both the aux-device and display are selected, all the data from the host computer is processed internally in the display and transmitted to the aux-device simultaneously.

4. Whether or not the value of n is within range, a command code is sent to the aux-device. Therefore, when display is selected by <ESC=2>, this command sends <1BH> <3DH> <02H> to the aux-device and stops transmitting data to aux-device. Later, when the aux-device is selected by <ESC=1>, this command sends command code <1BH> <3DH> <01H> to the aux-device and starts transmitting data to the aux-device.

5. The same procedure is performed for <ESC=3> after executing <ESC=2>.

6. If <ESC=2> is received again after selecting display by executing <ESC=2>, the 3-byte data is executed only inside of the display, and nothing is sent to aux-device.

7. If the value n in <ESC=n> after executing <ESC=2> is out of range, nothing is sent to the

aux-device.

[Parameters]

n	aux-device	display
1	**ON**	**OFF**
2	**OFF**	**ON**
3	**ON**	**ON**

n	peripheral device	1	0
Bit0	aux-device (printer)	**selected**	**cancelled**
Bit1	Display	**selected**	**cancelled**
Bit2~Bit7	Reserved	X	X

B1-2. Initialization of a display

ASCII	ESC	@
HEX	1BH	40H

[Description]   After execute this command, DSP840 will be initialized, the cursor moves to the
home position.

B1-3. Selection of an international character set

ASCII	ESC	R	country
HEX	1BH	52H	00H$\leq$**n**$\leq$0EH

[Description]   please see **A1-2** command.

[Parameters]

country	U.S.A.	France	Germany	U.K.	Denmark I	Sweden	Italy	Spain
n	00H	01H	02H	03H	04H	05H	06H	07H
country	Japan	Norway	Denmark II	East Europe	Russian	Hebrew	Greek	
n	08H	09H	0AH	0BH	0CH	0DH	0EH	

B1-4. Selection of a character code table

ASCII	ESC	t	Page
HEX	1BH	74H	**n**

[Description]

This command selects a **Page n** from the character code table as below. The alphanumeric
characters (20H to 7FH) are the same for each page. But the graphic characters (80H to FFH) are
different on each page. The default setting is **Page 0**.

[Parameters]

n	Character code table
0	**Page 0** (PC437 (U.S.A., standard Europe)) (see Table1)

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1	**Page 1** (Katakana) (see Table 3)
3	**Page 3** (see Table 8)
4	**Page 4** (see Table 9)
5	**Page 5** (see Table 10)
14	**Page 14** (Greek) (see Table 7)
17	**Page 17** (see Table 11)
18	**Page 18** (see Table 12)
19	**Page 19** (see Table13)
255	**Page 255** (see Table 14)

Others of **Page n** are the same as **Page 0**.

B2-1. Specify over-writing mode

ASCII	US	MD1
HEX	1FH	01H

[Description]   Specify the overwrite mode as the screen display mode.

B2-2. Specify vertical scroll mode

ASCII	US	MD2
HEX	1FH	02H

[Description]   Specify the vertical scroll mode as the screen display mode.

B2-3. Specify horizontal scroll mode

ASCII	US	MD3
HEX	1FH	03H

[Description]   Specify horizontal scroll mode as the screen display mode.

B2-4. Specify and release of a cursor displaying

ASCII	US	C	value
HEX	1FH	43H	**n**

[Description]   Specify a cursor displaying or release.

A cursor displaying is specified if **n**= 01H or 31H.

A cursor displaying is cancelled if **n**= 00H or 30H.

B2-5. Blink display screen

ASCII	US	E	value
HEX	1FH	45H	**n**

[Description]

You can control blink speed by this command. The blink time is the shortest if n=01H, and the

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longest if n=FEH. The DSP840 will stop blinking if n=00H. The DSP840 will switch the screen off if n=FFH.

B2-6. Specify and release of a reverse character

ASCII	US	r	value
HEX	1FH	72H	**n**

[Description]

Execute reversed character if **n**=01H or 31H or cancel if **n**=00H or 30H.

B2-7. Self Test

ASCII	US	@
HEX	1FH	40H

[Description]

DSP840 will execute self-test by this command. When self-test completed, cursor moves to home position and display is cleared.

B2-8. The cursor moves up

ASCII	US	LF
HEX	1FH	0AH

[Description]

The cursor moves up by one line.

When the cursor is on the upper line, this command operates differently depending on the display mode.

1. Overwrite mode:

    The cursor is moved to the same column on the lower line.
2. Vertical scroll mode:

    The characters displayed on the upper line are scrolled to the lower line, and the upper line is cleared. The cursor remains at the same position.
3. Horizontal scroll mode:

    The cursor is not moved.

B2-9. The cursor moves to right-most position

ASCII	US	CR
HEX	1FH	0DH

[Description]   The cursor moves to the right end on the same line.

B2-10. The cursor moves to bottom position

ASCII	US	B
HEX	1FH	42H

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[Description]

The cursor moves to the right-end position on the lower line(bottom position).

B2-11. The cursor moves to specified position

ASCII	US	$	column	row
HEX	1FH	24H	01H≦**n**≦14H	**m**=01H or 02H

[Description]

The cursor moves to **n**th column and **m**th row position. DSP840 will ignore this command and keep same cursor position, if **n** or **m** is over the range of the screen.

B3-1. Moves cursor left

ASCII	BS
HEX	08H

[Description]   The cursor moves to left position by one character.

B3-2. Moves cursor right

ASCII	HT
HEX	09H

[Description]   The cursor moves to right position by one character.

B3-3. The cursor moves down

ASCII	LF
HEX	0AH

[Description]

The cursor moves down by one line.

When the cursor is on the lower line, this command operates differently depending on the display mode.

1. Overwrite mode:

   The cursor is moved to the same column on the upper line.

2. Vertical scroll mode:

   The characters displayed on the lower line are scrolled to the upper line, and the lower line is cleared. The cursor remains at the same position.

3. Horizontal scroll mode:

   The cursor is not moved.

B3-4. The cursor moves to home position

ASCII	HOM
HEX	0BH

[Description]   The cursor moves to Home position.

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B3-5. The cursor moves to left-most position

ASCII	CR
HEX	0DH

[Description]   The cursor moves to left end of the same line.

B3-6. Clear screen

ASCII	CLR
HEX	0CH

[Description]

Display screen is cleared. After execution command, the cursor moves to Home position.

B3-7. Clear cursor line

ASCII	CAN
HEX	18H

[Description]

Clear the line containing the cursor. After executing this command, the cursor moves to the left-end position of the line.

C. Group C Command Instructions (CD5220 Command sets)

C-1. Specify over-writing mode

ASCII	ESC	DC1
HEX	1BH	11H

[Description]   Specify the overwrite mode as the screen display mode.

C-2. Specify vertical scroll mode

ASCII	ESC	DC2
HEX	1BH	12H

[Description]   Specify the vertical scroll mode as the screen display mode.

C-3. Specify horizontal scroll mode

ASCII	ESC	DC3
HEX	1BH	13H

[Description]   Specify horizontal scroll mode as the screen display mode.

C-4. Moves cursor left

ASCII	ESC	[	D

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HEX	1BH	5BH	44H

[Description]   The cursor moves to left position by one character.

C-5. Moves cursor right

ASCII	ESC	[	C
HEX	1BH	5BH	43H

[Description]   The cursor moves to right position by one character.

C-6. The cursor moves up

ASCII	ESC	[	A
HEX	1BH	5BH	41H

[Description] please see **B2-8** command description.

C-7. The cursor moves down

ASCII	ESC	[	B
HEX	1BH	5BH	42H

[Description]   please see **B3-3** command description.

C-8. The cursor moves to home position

ASCII	ESC	[	H
HEX	1BH	5BH	48H

[Description]   The cursor moves to Home position.

C-9. The cursor moves to left-most position

ASCII	ESC	[	L
HEX	1BH	5BH	4CH

[Description]   The cursor moves to left end of the same line.

C-10. The cursor moves to right-most position

ASCII	ESC	[	R
HEX	1BH	5BH	52H

[Description]   The cursor moves to the right end on the same line.

C-11. The cursor moves to bottom position

ASCII	ESC	[	K
HEX	1BH	5BH	4BH

[Description]   The cursor moves to the right-end position on the lower line(bottom position).

C-12. The cursor moves to specified position

ASCII	ESC	l	column	row
HEX	1FH	24H	01H≦**n**≦14H	**m**=01H or 02H

[Description] please see **B2-11** command description.

C-13. Initialization of a display

ASCII	ESC	@
HEX	1BH	40H

[Description]   please see **B1-2** command description.

C-14. Clear screen

ASCII	CLR
HEX	0CH

[Description] please see **B3-6** command description.

C-15. Clear cursor line

ASCII	CAN
HEX	18H

[Description] please see **B3-7** command description.

C-16. Specify and release of a cursor displaying

ASCII	ESC	_	value
HEX	1BH	5FH	**n**

[Description] please see **B2-4** command description.

C-17. Selection of an international character set

ASCII	ESC	f	country
HEX	1BH	66H	00H≦**n**≦0DH

[Description]   please see **B1-3** command description.

C-18. Selection of peripheral device(Aux-device)

ASCII	ESC	=	peripheral
HEX	1BH	3DH	**n**

[Description] please see **B1-1** command description.

8. SPECIFICATIONS

A. Display

- Vacuum fluorescent display (VFD).
- Number of characters: 40 (20 columns x 2 lines).
- Display color: Blue-green.
- Character font: 5 x 7 dot matrix.
- Character size: H9 x W5.25 mm.
- Character type: Alpha numeric: 95

    International characters: 32

    Graphic characters: 128
- Power consumption: 250mA Max. 12VDC(for DSP840)

    450mA max. 12VDC(for DSP842)

B. Dimension

- Display unit: **H**85 * **W**230 * **D**42mm.
- Total height: High pole---42.75cm ; Low pole---18.25cm
- Base: **D**115 * **W**235 * **H**47mm.
- Tilt angle: 30 degree **MAX**.
- Horizontal rotation: 300 degree.
- Weight: Approx. 1055 grams.

C. Interface

- Display interface: RS-232C.
- Data transmission method: Serial

C. Reliability: MTBF 20,000 hours (power on hour)

D. Operating environment

- Temperature: 5 to 45 degree C.
- Humidity: 10 to 85% relative

E. Storage environment

- Temperature: -10 to 50 degree C.
- Humidity: 10 to 90% relative.

9. Instruction of Demo Software

A. **Please put demo disc and install the demo software as instruction.**

B. **After installation, you can run program under your specified program group.**

C. **While you execute it, the first page show as the right figure.**

    Please check the "RS232 Settings", these communication parameters must be same as the DSP840 parameters. If anyone is different, DSP840 will not display correctly.

    <u>Tip:</u> **when you power on the DSP840, you will see the communication parameters of DSP840 on the lower line.**
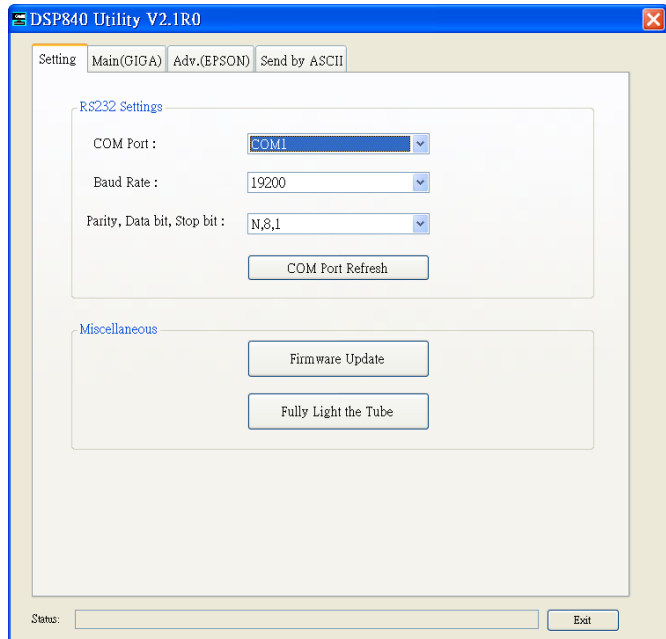
D. **When DSP840 communication parameters are as the same as your computer, you can control the DSP840 via your computer. So, please select the "Main(GIGA)" tabbed page. You will see the window as the right figure.**

    Please refer command Group A. It shows all on this page

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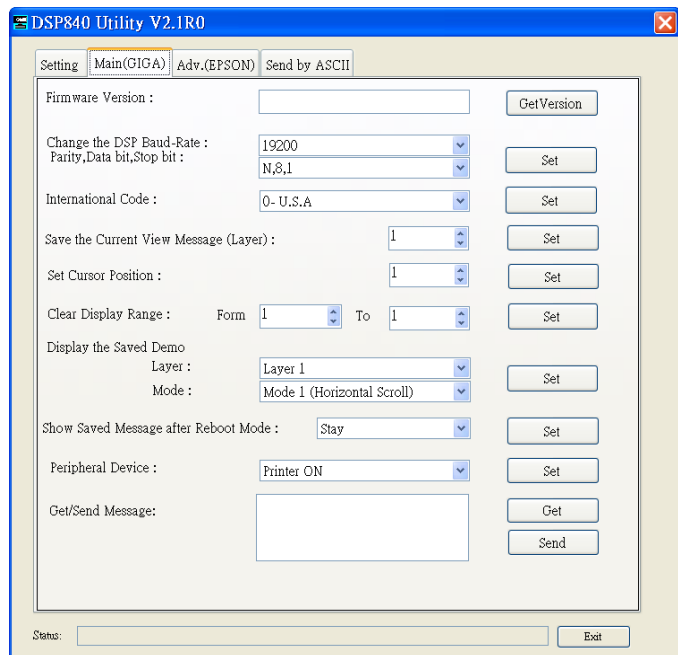
E. You can select the Adv.(EPSON) page to operate command Group B & Group C & Group D
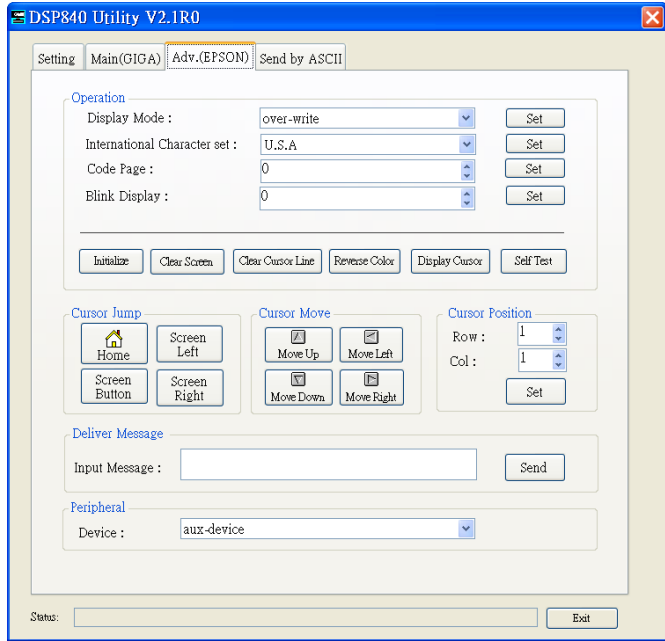
F. You can press ASCII code on the "Send by ASCII" tabbed page.

This function let you try the command set directly.

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