DSP820-18 to add "Russian" character set.

You can set "Russian" character as sequent;

symbol	ESC	I	<
ASCII	1BH	49H	3CH

Table (Russian)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	ø	▶		0	@	P	`	p	А	Р	а	▨	└	ɗ	р	−
1	☺	◄	!	1	A	Q	a	q	Б	С	б	▓	┴	Đ	с	"
2	☻	↕	"	2	B	R	b	r	В	Т	в	■	┬	ď	т	.
3	♥	‼	#	3	C	S	c	s	Г	У	г	│	├	Ё	у	˜
4	♦	Я	$	4	D	T	d	t	Д	Ф	д	┤	─	ɗ	ф	˜
5	♣	§	%	5	E	U	e	u	Е	Х	е	Á	┼	ň	х	§
6	♠	▬	&	6	F	V	f	v	Ж	Ц	ж	Ä	Ă	í	ц	÷
7	●	↨	'	7	G	W	g	w	З	Ч	з	Ě	ă	ı	ч	.
8	◘	↑	(	8	H	X	h	x	И	Ш	и	Ş	└	ě	ш	°
9	○	↓	)	9	I	Y	i	y	Й	Щ	й	╣	╔	┘	щ	¨
A	◙	→	*	:	J	Z	j	z	К	Ъ	к	║	╩	┌	ъ	·
B	♂	←	+	;	K	[	k	{	Л	Ы	л	╗	╦	■	ы	ú
C	♀	∟	,	<	L	\	l	|	М	Ь	м	╝	╠	▪	ь	ř
D	♪	↔	-	=	M	]	m	}	Н	Э	н	ż	═	т	э	ř
E	♫	▲	.	>	N	^	n	´	О	Ю	о	ż	╬	ů	ю	▪
F	☼	▼	/	?	O	_	o	△	П	Я	п	┐	╧	▪	я	■

DSP820 Manual

1. Introduction

DSP820 Graphic LCD Customer Display is an artistic design POS system peripheral device. It is for use with ECR, POS system to display the purchased articles, prices and the amount to the customers. Also it is capable to show the messages with image picture.

2.Installation

1.Turn off the computer and the DC power supply.

2.Connect the D-sub 9 pin connector with the computer.

3.Connect the DC power supply to the DC Jack of the display.

4.Turn on the computer and the DC power supply.

   DSP820 will show a default page.

3.Controls

DSP820 has equipped with separate backlight Brightness and Contrast slide controls.

For power saving, the DSP820 can turn off backlight after 3 or 8 minutes after the last command. And it will turn on backlight immediately when arrive command. This power saving feature is selectable.
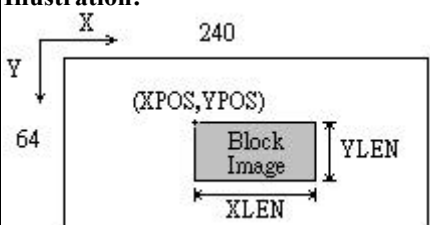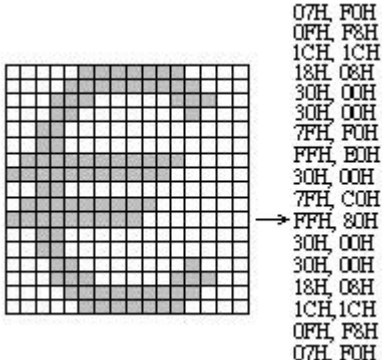
The DSP820 can display characters at text mode with 4(rows)*20(columns). It is built with 12 country ASCII tables. And it can display graphic image (**BMP** format) at graphic mode with 240*64(pixel).

4.RS-232C Interface

Baud rate	**19.2K/9.6K/4.8K/2.4K/1.2K/600**
Data bits	**8**
Parity	**None**
Stop bit	**1**
Handshaking	**Hardware(RTS/CTS)**

5.Command Set

COMMAND	CONTROL CODE	DESCRIPTION
Clear	"ESC" "C"	Clear all display area
Cursor positioning	"ESC" "M" ASCII(**X**) ASCII(**Y**)	Move cursor to position **X**(0-19);**Y**(0-3)
Display character	ASCII code from 1 to 255	Show the related character in the current position and then increase cursor position. In case of writing last character line, cursor will move in the first position of the following row. In case of writing last character line of the last line, cursor will move in the first position of the first line
Carriage Return	ASCII code=13	Move cursor position to the first character of the following row.
Line Feed	ASCII code=10	Pole display ignore this code
Display graphic image	"ESC" "B" BMP[1] ... BMP[2110]	Display a graphic file in **BMP** format. After the two control command, characters must be sent with all the graphic files in **BMP** format black and white as sequence of 2110, 8bit codes to show 240*64 pixels
Change Baud-Rate	"ESC" "S" ASCII(**B**) **Default: 19.2K**	Change current Baud-Rate. Once you change into new setting, it will be saved into EEPROM. So it will keep your last setting when you turn off DSP. After this, PC-host also need to change to this new setting for communication. **B**=30(H),19.2K * **B**=33(H),2.4K **B**=31(H),9.6K **B**=34(H),1.2K **B**=32(H),4.8K **B**=35(H),600
Select Character Set Table	"ESC" "I" ASCII(**C**) **Default: U.S.A.**	Change current Char-Set Table. Once you change into new setting, it will be saved into EEPROM. So it will keep your last setting when you turn off DSP. After this, when you send a character, DSP will look for it in selected table and show it on display. **C**=30(H) U.S.A. * **C**=34(H) Denmark I **C**=38(H) Japan **C**=31(H) France **C**=35(H) Sweden **C**=39(H) Norway **C**=32(H) Germany **C**=36(H) Italy **C**=3A(H) Denmark II **C**=33(H) U.K. **C**=37(H) Spain **C**=3B(H) East Europe
Back-light power saving selection	"ESC" "P" ASCII(**D**) **Default: no power saving**	Select backlight power saving. Once you change into new setting, it will be saved into EEPROM. So it will keep your last setting when you turn off DSP. With power saving, DSP will turn off the backlight after 3 or 8 minutes after the last command. **D**=30(H), no power saving * **D**=31(H), 3 minutes period **D**=32(H), 8 minutes period
Save current message page	"ESC" "V" ASCII(**E**)	Save current page to EEPROM layer. DSP always show the first layer when it turns on. So you can change your message as you want and save it. **E**=31(H), save to the first layer **E**=32(H), save to the second layer
Inquire version	"ESC" "F"	After you send this command, DSP820 will respond you a "DSP820 ver X.XX" message. Also you can use this function to check whether DSP820 is on line still.
Display the saved DEMO message	"ESC" "D" ASCII(**L**) ASCII(**M**)	**L**=31(H), the first layer is selected. **L**=32(H), the second layer is selected. **L**=33(H),to alternate between the 1st and 2nd layer be selected.* **M**=31(H), static display.
Upgrade firmware	"ESC" "Load"	Upgrade the firmware on DSP820. Please contact us to get more detail...

Block image	"ESC" "Z" BIN(**XPOS**) BIN(**YPOS**) BIN(**XLEN**) BIN(**YLEN**) BMP(**DATA0**) BMP(**DATA1**) BMP(**DATA2**) … BMP(**DATAn**)	Show block image.
		00(H)<=**XPOS**<=EF(H), the left-most position of block image.
		00(H)<=**YPOS**<=3F(H), the top-most position of block image.
		01(H)<=**XLEN**<=F0(H), the length of block image. **Constriction**: **XLEN** should be many times of 8. (ex. **8,16,24,..**)
		01(H)<=**YLEN**<=40(H), the height of block image.
		DATA1~n, block image data. Byte by byte, sequent, from left to right, top to bottom.
		Illustration: And, we want to show a Euro sign at (8,9) of DSP820 coordination. Now, how to do it? First, We must have a block image of Euro sign. Like following, After this, we send sequent command to DSP820 as following, **ESC**, **Z**, 08H, 09H, 10H, 11H, 07H, F0H, 0FH, F8H, 1CH, 1CH, 18H, 08H, 30H, 00H, 30H, 00H, 7FH, F0H, 30H, 00H, 7FH, C0H, FFH, 80H, 30H, 00H, 30H, 00H, 18H, 08H, 1CH, 1CH, 0FH, F8H, 07H, F0H

<u>Note:</u> 1. ASCII code of **ESC** is **1BH**.   2. * represent factory setting.(Default)
    3. (H) represent Hexadecimal value

6.LCD Characteristics

LCD type	FSTN LCD
View area	133*39(mm)
Number of dots	240*64(dots)
Backlight	CCFL
Dot pitch	0.53*0.53(mm)

7.Connectors

A. Connector: 9 pin D-sub Female

Pin #	Signal
1	N.C.
2	TX
3	RX
4	DSR
5	SGND
6	DTR
7	CTS
8	RTS
9	N.C.

B. DC power jack

Pin #	Signal
center	+DC 12V
outer	Ground

8.Specifications

A.Dimension: High-foot version

    Display unit: **H**110***W**230***D**45(mm)

    Support pole: Telescopic pole from 270(mm) to 440 (mm) with diameter 38(mm)

    Base: 12(mm) with 80(mm) diameter

    Tilt angle: 30(degree) max.

    Horizontal rotation: 360(degree)

    Weight: Approx. 800(grams)

B.Operation environment:

    Temperature: 0~45 Degree C

    Humidity:10 to 85% relative

C.Storage environment:

    Temperature: -10 to 50 Degree C

    Humidity: 10 to 90% relative

D. Power consumption: 250mA max. 12VDC with the LCM back-light.

                50mA max. 12VDC without the LCM back-light.

APPENDEX A. CHARACTER TABLES

TABLE 1 (U.S.A.)

Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	€	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	▫	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	◦	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	θ	·
A		→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	
B	♂		+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	└	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D		↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	∈	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▀	∩	

TABLE 2

	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
A	Denmark II	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
B	East Europe	#	$	@	[	\	]	^	`	{	|	}	~

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TABLE 3 (Japan)

Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p		⌐		─	タ	ミ	▮	⊤
1	☺	◄	!	1	A	Q	a	q	▮	┌	¨	ア	チ	ム	▬	▬
2	☻	↕	"	2	B	R	b	r	▬	▪	⌐	イ	ツ	メ	▬	▬
3	♥	‼	#	3	C	S	c	s	▮	▪	⌐	ウ	テ	モ	▮	▬
4	♦	¶	$	4	D	T	d	t	▬	▪	ˎ	エ	ト	ヤ	+	▮
5	♣	§	%	5	E	U	e	u	▮	▪	˙	オ	ナ	ユ	▮	▮
6	♠	▬	&	6	F	V	f	v	▬	╱	ヲ	カ	ニ	ヨ	└	▮
7	●	↕	'	7	G	W	g	w	▮	╲	ァ	キ	ヌ	ラ	▬	▬
8	◘	↑	(	8	H	X	h	x	▬	◣	ィ	ク	ネ	リ	■	▬
9	○	↓	)	9	I	Y	i	y	▮	◤	ゥ	ケ	ノ	ル	▨	◢
A		→	*	:	J	Z	j	z	▬	┌	ェ	コ	ハ	レ	⊥	◣
B	♂		+	;	K	[	k	{	▮	⊥	ォ	サ	ヒ	ロ	←	≡
C	♀	┘	,	<	L	¥	l	|	├	┬	ャ	シ	フ	ワ	↑	‖
D		↔	-	=	M	|	m	}	▬	┤	ュ	ス	ヘ	ン	→	∟
E	♪	▲	.	>	N	^	n	~	└	♦	ョ	セ	ホ	゜	↓	┘
F	☼	▼	/	?	O	_	o	△	┐	×	ッ	ソ	マ	゜	⌐	┐

TABLE 4 (East Europe)

Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á		└	đ	Ó	─
1	☺	◄	!	1	A	Q	a	q	ü	Ĺ	í		┴	Đ	β	″
2	☻	↕	"	2	B	R	b	r	é	ì	ó	■	┬	Ď	ô	·
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ń	ˇ
4	♦	¶	$	4	D	T	d	t	ä	ö	Ą	┤	─	ď	ń	˘
5	♣	§	%	5	E	U	e	u	ů	Ľ	ą	Á	┼	Ň	ň	§
6	♠	▬	&	6	F	V	f	v	ć	Ľ	Ž	Ã	Ă	Í	Š	÷
7	●	↕	'	7	G	W	g	w	Ç	Ś	ž	Ĕ	ã	Î	š	¸
8	◘	↑	(	8	H	X	h	x	ł	ś	š	Ş	└	ĕ	Ŕ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	ę	╣	╔	┘	Ú	·
A		→	*	:	J	Z	j	z	Ő	Ü	á	║	╩	┌	ŕ	·
B	♂		+	;	K	[	k	{	ő	Ť	ź	╗	╦	■	Ű	ű
C	♀	┘	,	<	L	\	l	|	î	Ť	Č	╝	╠	■	ý	Ř
D		↔	-	=	M	]	m	}	Ź	Ł	ş	Ż	=	Ţ	Ý	ř
E	♪	▲	.	>	N	^	n	~	Ä	×	«	ż	╬	Ŭ	ţ	■
F	☼	▼	/	?	O	_	o	△	Ć	č	»	┐	¤	■	´	€

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