64x32 LCD SmartSwitch & SmartDisplay evaluation kit

Operating manual

Please read this operating manual carefully before you use 64x32 LCD SmartSwitch & SmartDisplay evaluation kit.

1. Outline of 64x32 LCD SmartSwitch & SmartDisplay evaluation kit

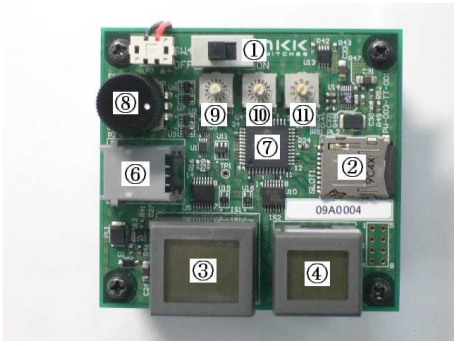
64x32 LCD SmartSwitch & SmartDisplay evaluation kit is an evaluation kit for 64x32 LCD SmartSwitch, Compact SmartSwitch, and SmartDisplay. With this kit, users can display their own graphics on 64x32 LCD SmartSwitch, Compact SmartSwitch, or on SmartDisplay. The graphic data can be created or edited by "IS Color Editor" that we supply as free software.Sample graphic data are also included in this kit. Users can also simulate changes of 64 colors of backlight LED and total brightness.

2. Included in this kit

(1) 64x32 LCD SmartSwitch & SmartDisplay evaluation kit main board (double-decker style)	1 set
(2) 64x32 LCD SmartSwitch (mounted on the main board)	1 pc
(3) 64x32 Compact LCD SmartSwitch (mounted on the main board)	1 pc
(4) 64x32 LCD SmartDisplay (mounted on a custom socket)	1 pc
(5) microSD card (With sample data on it, inserted in the card slot)	1 pc
(6) Operating manual (simplified version)	1 sheet

※ Please prepare three AA alkaline batteries except above.

3. The name of each part and its function



With 64x32 SmartSwitch (as delivered)

With 64x32 SmartDisplay

Bottom side

① Power switch (right ON)
② microSD card slot
③ 64x32 LCD SmartSwitch
④ 64x32 Compact LCD SmartSwitch
⑤ 64x32 LCD SmartDisplay
⑥ RJ-11 jack (for downloading firmware)
⑦ Microchip PIC24FJ48GA004-I/PT microcontroller
⑧ Rotary encoder(Rotating right: forward, Rotating left: reverse)
Users can change bitmaps by rotating this encoder.
⑨ Dip rotary switch 1 For setting backlight LED color 1

⑩ Dip rotary switch 2 For setting backlight LED color 2
⑪ Dip rotary switch 3 Dimmer for backlight LED
⑫ Battery box
Insert three AA alkaline batteries into battery holders, all in the same direction.

4. Operation

(1) To display sample graphics
(a) Insert attached microSD card with sample data into the microSD card slot.(The microSD card is already inserted as delivered.)
(b) Mount SmartSwitch or SmartDisplay on the kit. (SmartSwitch is mounted as delivered.)
(c) Turn on the power, then a sample graphic is displayed.
(d) Change graphics by rotating rotary encoder. If you use SmartSwitch, you can also forward graphics by pressing SmartSwitch.

(2) To display your own graphics
(a) Start “IS Color Editor” on your PC and set “Panel setting” to “64x32” and “Black and white”, then create or edit graphic data. See IS Color Editor help for details.
(b) Prepare a blank microSD card and make “6432” folder in root directory. Save graphic data under “6432” folder of micro SD card by using card writer. File names shall be “image.???” You can designate the file extension as numbers from “000” to “999”.
(c) Insert the microSD card stored with data in the microSD card slot of the kit.
(d) After the power is turned on, the data with the smallest extension number will be displayed.
(e) If you rotate the rotary encoder clockwise, the file with next bigger extension number will be displayed sequentially. If you rotate the encoder counterclockwise, the file with next smaller extension will be displayed sequentially. After the file with the biggest (smallest) extension number, the file with the smallest (biggest) extension number will be displayed.
(f) If SmartSwitch is pressed, only the graphic file on that SmartSwitch will be incremented to the file with the next bigger extension number sequentially.

(3) Controlling backlight LED
(a) Adjust the total brightness of backlight LED in 8 steps by changing dip rotary switch 3.
0: Max. --- 7: Min.
(b) Adjust the color of backlight LED by changing dip rotary switch 1 and 2 in 64-color or 8-color mode.
(Please refer to the table below for the specific setting of each color.)
Dip rotary switch 1: 0 - 3 64-color mode
Dip rotary switch 2: F 8-color mode

Table for backlight color setting

<64-color mode>

4 steps of brightness for each Red, Green, and Blue can be adjusted. So total 64 colors are available.

(LED Bright 3 - 1 Dim, blank=off)

Dip rotary switch 1	Dip rotary switch 2	LED brightness R	G	B	Color (64 color)
0	0				dimm
	1			1	
	2			2	
	3			3	Blue
	4		1		
	5		1	1	
	6		1	2	
	7		1	3	
	8		2		
	9		2	1	
	A		2	2	
	B		2	3	
	C		3		Green
	D		3	1	
	E		3	2	
	F		3	3	Cyan
1	0	1			
	1	1		1	
	2	1		2	
	3	1		3	
	4	1	1		
	5	1	1	1	
	6	1	1	2	
	7	1	1	3	
	8	1	2		
	9	1	2	1	
	A	1	2	2	
	B	1	2	3	
	C	1	3		
	D	1	3	1	
	E	1	3	2	
	F	1	3	3	
2	0	2			
	1	2		1	
	2	2		2	
	3	2		3	
	4	2	1		
	5	2	1	1	
	6	2	1	2	
	7	2	1	3	
	8	2	2		
	9	2	2	1	
	A	2	2	2	
	B	2	2	3	
	C	2	3		
	D	2	3	1	
	E	2	3	2	
	F	2	3	3	
3	0	3			Red
	1	3		1	
	2	3		2	
	3	3		3	Magenta
	4	3	1		
	5	3	1	1	
	6	3	1	2	
	7	3	1	3	
	8	3	2		
	9	3	2	1	
	A	3	2	2	
	B	3	2	3	
	C	3	3		Amber
	D	3	3	1	
	E	3	3	2	
	F	3	3	3	White

<8-color mode>

The brightness for R, G, and B are fixed at level 3 (bright) and 8 colors are available.

Dip rotary switch 1	Dip rotary switch 2	LED brightness R	G	B	Color (8 color)
F	0				dimm
	1			3	Blue
	2		3		Green
	3		3	3	Cyan
	4	3			Red
	5	3		3	Magenta
	6	3	3		Amber
	7	3	3	3	White

5. Disclosure of the firmware, the circuit diagrams, and of the parts list

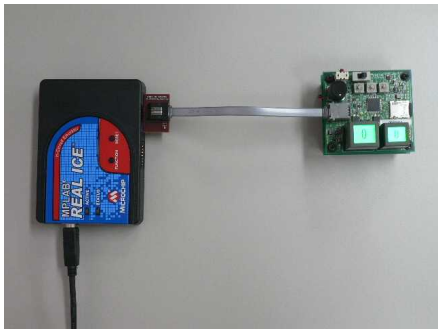
You can download the firmware (for PIC24F, C language), the circuit diagrams, and the parts list of this evaluation kit from the following URL:
http://www.nkksmartswitch.com/support/ (registration is required)

(1) You need the following tools and software for modifying the firmware:

(a) Microchip MPLAB IDE (URL may change in future.)
http://www.microchip.Com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=81

(b) MPLAB C Compiler for PIC24 and dsPIC v3.21 in LITE mode
(Version and URL may change in future.)
http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=1406&dDocName=en536656

(c) Programmers for PIC24F



PICkit™ 2＋AC164110 - RJ-11 to ICSP Adapter、MPLAB REAL ICE, or others (Left photo shows MPLAB REALECE connected to the evaluation kit.)

6. Cautions on usage

(1) The board and the parts are exposed in this kit. Please pay enough attention to static electricity, moisture, dusts, or to spit, in order not damaging the kit.
(2) This kit is for evaluation purpose only and shall not be used for actual appliance. External lands are, however, available for the connection with external equipments on the kit. The firmware must be modified in that case.
(3) Do not user any other power supply except three AA alkaline batteries.
(4) Insert batteries in right direction.
(5) Do not repeat to turn on/off the power quickly.
(6) Use the evaluation kit in temperature from 0℃ to 40℃ in a room and avoid dew condensation.
(7) Please refer to the specifications for the detailed specification of 64x32 LCD SmartSwitch, SmartDisplay, and of 64x32 Compact LCD SmartSwitch.
(8) Pay special attention not to bend terminal when you mount or dismount SmartSwitch or SmartDisplay.
(9) Modifying the firmware shall be done in users' responsibility. We do not guarantee the product after any modification.
(10) Disclosed firmware can be used only for PIC24F of Microchip.
(11) Some programs and header files in the firmware are copywrited works of Microchip. Use them by following the terms and conditions provided by Microchip.

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