OLED rocker IS evaluation kit / Operating manual

Nihon Kaiheiki Ind. Co., LTd. (NKK switches)

Please read this operating manual carefully before you use OLED rocker IS evaluation kit.

## 1. Outline of OLED SmartSwitch & SmartDisplay evaluation kit

With this OLED rocker IS evaluation kit, users can let their own graphics or menus be displayed on OLED rocker IS and can simulate operations through tree search menus. The graphic data can be created or edited by "IS color editor" that we supply as a free software. There are three pre-installed demo data as well.

2. Included in the kit

(1) OLED rocker IS evaluation kit main board   1 set
(2) OLED rocker IS (mounted on the main board)   1 pc
(3) microSD card (with sample data on it, inserted in the card slot)   1pc
(4) Operating manual (simplified version)   1 sheet
  ＊　Please prepare three AAA alkaline batteries except above.

3. The name of each part and its function
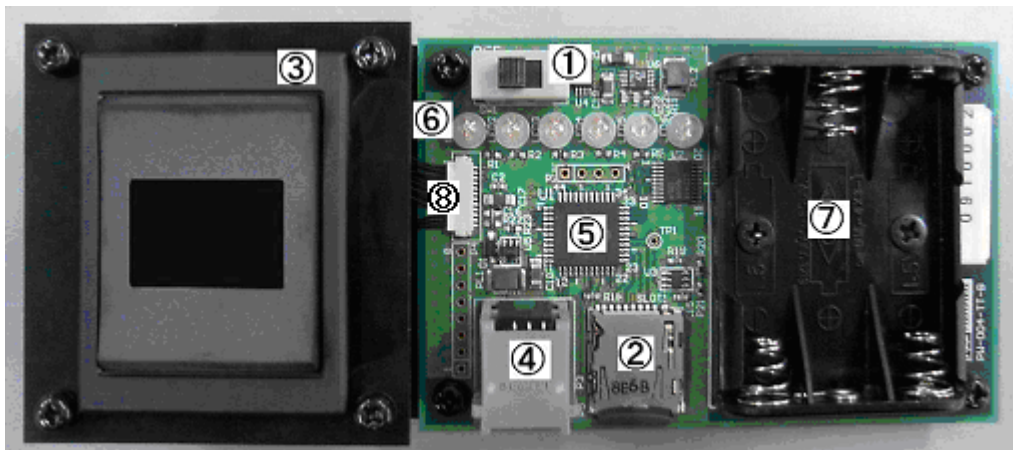
① Power switch (right ON)

After turning on the switch, all LEDs ⑥ blink to ascertain that the power is properly generated.

② microSD card slot

If microSD card is not properly inserted, all LEDs keep glowing after turning on the power. In that case, turn off the power and insert a microSD card into this slot, then turn on the power again.

③ OLED rocker IS

④ RJ-11 jack (for downloading firmware)

⑤ Microcontroller [Microchip PIC24FJ48GA004-I/PT]

⑥ 6 LEDs for showing the menu selection status [color: red]

⑦ Battery box

Insert three AAA alkaline batteries into battery holders surely and properly.

⑧ OLED rocker IS harness and connector

4. Operation

(1) To display sample menus

(a) If the attached microSD card is not inserted in the microSD card slot, insert it.

(b) Turn on the power.

(c) Change the menus by pressing upper or lower key. Choose a menu by pressing center key.

Upper key

Center key

Lower key
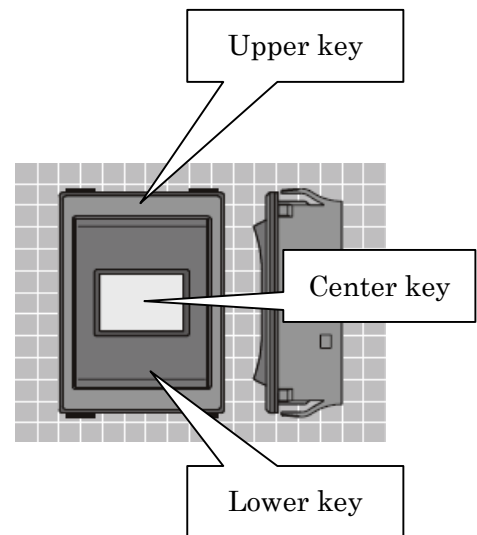
(2) To display your own menus

(a) Start "IS color editor" on your PC and create or edit graphic data.

(b) Save the graphic data in microSD card by using card writer. Use the following folders and file names as described in 5.

(c) Insert the microSD card into the slot of the board.

(d) Follow the operations of from 4-(1)-(a) through 4-(1)-(c).

5. File names and folder allocation on microSD card and operations of OLED rocker IS evaluation kit

(1) Image files to be displayed on OLED rocker IS evaluation kit shall be generated and edited by "IS color editor". Set the panel setting to "64 X 48" and "Black and white" and create the data. (Please note that "black and white" images on IS color editor and on OLED rocker IS are reverse.

(2) Files names and folder names are fixed and shall follow the following rules.

(a) Menu items display files

Maximum 10 menu item display files can be placed in the same folder. File names shall be:

select.001, select.002, select.003,…, select.009, select.010.

For example, texts or icons meaning as "Function 1" shall be with select.001, "Function 2" with select.002.

(b) Special function files

select.000

This file is for returning to previous, upper layer of menus, when searching in tree-structure menus. Image or icon shall indicate "one step back" or "escape".

select.800

If this file is placed in a layer (folder), the kit regards the layer as the bottom. Image or icon can indicate, e.g. "return to top".

select.999

This file is normally not displayed, but used to show the operator that there are some errors in files. Image or icon shall simply indicate "error".
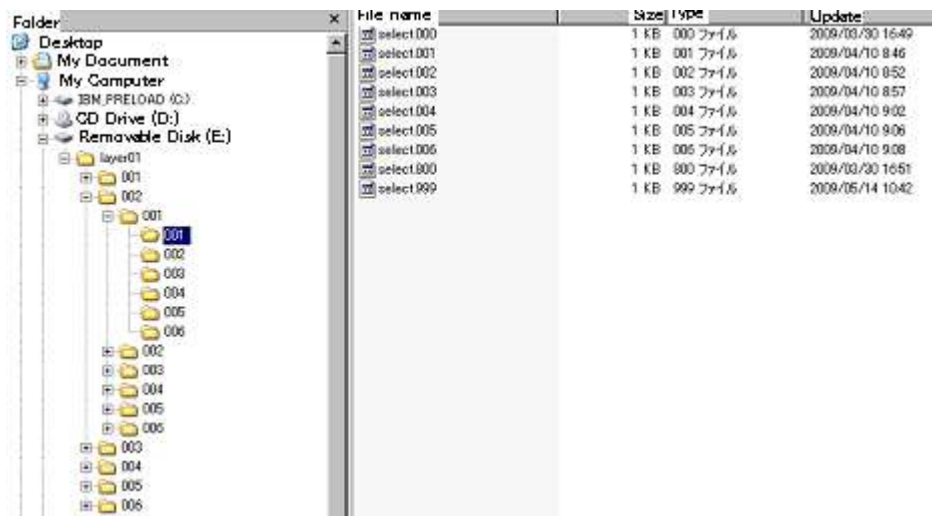
(c) Folders for tree-structure menus

In tree-search menus, if one menu item is selected, sub menus are displayed for further selection. In order to achieve tree-search, Windows folders are used.

Top layer folder shall be **"layer01"** just under the root folder.

Menu item display files such as "select.001, select.002, select.003,…, select.009, select.010" shall be placed under "layer01" and at them same time the folders **"001","002",…, "009","010"** shall be also placed in the same folder.

Sub menu item display files of select.001 shall be placed under the folder "001", and the ones of select.002 shall be under "002". Sub menu item display file names of select.001 shall be also select.001, select.002, select.003,…, select.009, select.010" placed under ¥layer01¥001 folder. (Please note that select.001 in layer01 and the one in ¥layer01¥001 are usually not necessarily the same.) Further lower layers can be placed in the same way. Maximum 6 layers can be used.

An example of tree structure folders (sample data on the attached microSD, 4 layers and 6 menu item display files per each folder)

(1) Specifications for tree search on OLED rocker IS kit

    (a) After the power is turned on, select.001 in layer01 folder is displayed on OLED. (If select.001 does not exist, the select.* file with the smallest extension number is displayed.)

    (b) When upper key is pressed, the select.* file with next bigger file extension number is displayed, excluding select.999. This is valid in all layers.

    (c) When lower key is pressed, the select.* file with next smaller file extension number is displayed, excluding select.999. This is valid in all layers.

    (d) When the select.* file with the biggest extension number (including select.800 and excluding select.999) is displayed and upper key is pressed, the select.* file with the smallest extension number (including select.000) is displayed. This is valid in all layers.

    (e) When the select.* file with the smallest extension number (including select.000) is displayed and the lower key is pressed, the select.* file with the biggest extension number (including select.800 and excluding select.999) is displayed. This is valid in all layers.

    (f) While select.001 is displayed and then center key of rocker IS is pressed, the current folder will be moved to "layer01¥001" and select.001 (if select.001 does not exist, the select.* file with the smallest extension number) in "layer01¥001" folder will be displayed.

The corresponding folder for each menu item display file is the same as its number in file extension, namely "layer01¥002" for select.002, "layer01¥003" for select.003, and so on. In the folder "layer01¥001", while select.001 in "layer01¥001"is displayed and then the center key is pressed, the current folder will be moved to then "layer01¥001¥001" and select.001 (if select.001 does not exist, the select.* file with the smallest extension number) in "layer01¥001¥001" will be displayed. Up to 10 layers including "layer01" layer can be used.

(g) If the current folder is except "layer01" and if select.000 is chosen, the current folder will be up by one layer and the select.* file that was displayed most recently in that folder will be displayed again. (For example, if we choose select.003 in layer01 and move to the folder "layer01¥003"and then choose select.000, we move to "layer01" and select.003 in layer01 will be displayed again. If we move beyond two layers or more, the last displayed file in each layer will be memorized and by repeating to choose select.000 in each layer, the memorized select.* file in upper layer will be displayed in series.)

(h) If there is select.800 in a folder, the folder is regarded as the bottom layer. (Even if there are 001, 002,…,010 folders, they will be ignored.) If select.001, select.002,…, or select.006 is chosen, corresponding LED (counted from the left) will be glowed. If the file is chosen again, the LED will be turned off. (The files from select.007 through select.010 can be placed at the bottom layer, but they just do not have the corresponding LEDs.) If select.800 is chosen in the bottom layer, the current folder will be then back to layer01, and all LEDs will be turned off, and selet.001 in layer01 will be displayed. If select.000 in the bottom layer is chosen and returned to one upper layer, all LEDs will be turned off as well.

(i) If there is no select.001 – select.010 file in each layer, select.999 will be displayed as error. (If select.999 exists. The select.999 file is recommended to be placed in all layers.) After select.999 is displayed and any key is pressed, the previous image will be displayed again.

(j) If center key is pressed while the relation between file names and folder names are not correct, select.999 file will be displayed. Such cases are:
①There is no folder (001 – 010) corresponding to select.001 – select.010.

②There is no select.* file under any folder from 001 through 010.

After select.999 is displayed and any key is pressed, the previous image will be displayed again.

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

（1）　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)

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

① Microchip MPLAB IDE

http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=1406&dDocName=en019469&part=SW007002

② MPLAB C Compiler for PIC24 v3.11(b) Student Edition

http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=1406&dDocName=en535364

③ Programmers for PIC24F

PICkit™ 2＋AC164110 - RJ-11 to ICSP Adapter、MPLAB REAL ICE, or others

（Left photo shows PICkit™ 2＋AC164110- RJ-11 to ICSP Adapter connected to the evaluation kit.

7. Cautions on usage

（1）The board and the parts are exposed for reference 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 controlling actual appliances. There are, however, extra I/O terminals equipped in this kit to be combined with external appliances for evaluation. The source code must be added and modified to use them.

（3）Insert the batteries in the right directions in the battery box.

（4）Do not use any other power supply except three AAA alkaline batteries.

（5）Do not turn on and off the power in a short interval.

（6）Use the evaluation kit in temperature from 0℃ to 40℃ in a room. Avoid dew condensation.

（7）Please refer to the specification of rocker IS, if necessary.

（8）Modifying or adding the firmware or the hardware shall be done in users' responsibility. We do not guarantee the product after any modification.

（9）Disclosed firmware can be used only for PIC24F of Microchip.

（10）Some programs and header files in the firmware are copywrited works of Microchip. Use them by following the terms and conditions provided by Microchip.

（11）Do not dismount rocker IS from the kit nor disconnect the harness from the connector.

<div align="right">END</div>