

RAiO

RA8815 /RA8816

圖形/文字

LCD 驅動控制器

常見使用問題及說明

Version 1.0

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RAiO Technology Inc.

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Update History		
Version	Date	Description
1.0	July 13, 2009	Preliminary Version

Basic Information

Question 1:

[As the Figure 1, why can not press SW0 and SW1 at the same time?](#)

問題 1. 參考圖 1，為何 SW0 和 SW1 無法同時動作？

Question 2:

[What is the duration of reset pulse after power-on with RA8816?](#)

問題 2. 在 RA8816 被 Power-on 後，Reset pulse 需要維持多長的時間？

Question 3:

[Datasheet doesn't specifies if RST is standard logic input pin or if it has some hysteresis included \(e.g. Schmitt trigger input\) to allow to input slow rise and falling edges on RST signal. Can RA8816 be reset by simple RC circuit?](#)

問題3. 在datasheet中並未規範RST Pin是一邏輯的輸入腳或內含遲滯線路(如Schmitt trigger input)，去允許輸入正緣或負緣的RST 信號。

Question 4:

[Why did we get a failure output when we made an auto-scroll function to the picture which is greater than 48 display lines?](#)

問題 4. 為何在做 auto-scroll function 時，當圖片超過 48 條顯示線時，我們會得到一個錯誤的顯示輸出？

Question 5:

[Is there any software command to reset RA8815/RA8816 instead of hardware reset \(RST\)?](#)

問題 5.

Question 6:

[How to choose the resistor value for the internal RC oscillator of RA8815 which be connected between pins RA and RB of RA8815?](#)

問題 6. 如何選用 RA8815 的內部 RC 振盪器的電阻值，其是被接在 RA8815 的 RA 與 RB 上的？

Question 7:

[How to choose the capacitor value for the bias circuit of RA8815/RA8816?](#)

問題 7. 如何選用 RA8815/RA8816 的高壓電路電容值？

Question 8:

[For RA8815, between the issues of two different commands or data, is it necessary to add a delay time and how long is the delay time will be recommended to use?](#)

問題 8. 以 RA8815 為例，在不同需求的兩個 commands 或 data 之間，其是須要加入一個延遲時間的嗎？還

有多長的 delay time 是被建議採用的？

Question 1: As the Figure 1, why can not press SW0 and SW1 at the same time?

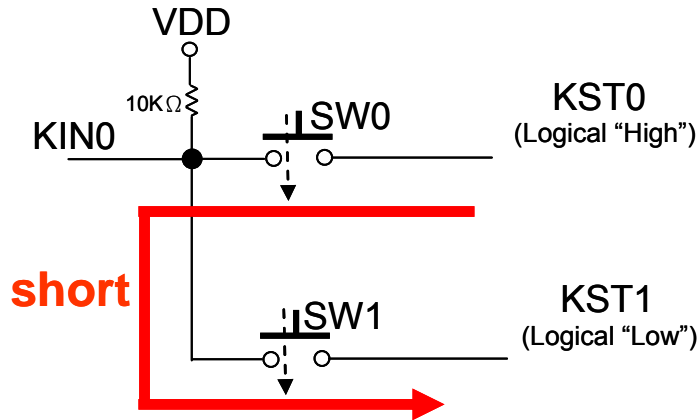


Figure-1

Answer: Please be noted that using the 2x strobcs and 1x input mode, pressed SW 0 and SW 1 at the same time could lead to a short circuit. Due to the KST0 and KST1 are scan signals and different logical level at the same time, so could not be pressed the 2 keys together simultaneously. We would like to suggest user to change the application circuit to 1x strobe and 2x inputs, or refer to the following 2x strobe and 1x input circuit which is the suggested circuits to avoid the above failure problem.

回覆：請注意，在使用 2x strobcs and 1x input mode 時，同時按下 SW0 以及 SW1 可能導致短路的現象發生，這是由於 KST0 以及 KST1 等掃描信號在同一時間內是屬於不同的邏輯準位，因此不可以同步地一起按下兩個按鍵。我們會建議使用者修改上述的電路為 1x strobe and 2x inputs(Figure-2-3)，或參考下述建議的 2x strobe and 1x input circuit 去避免前述的錯誤問題。

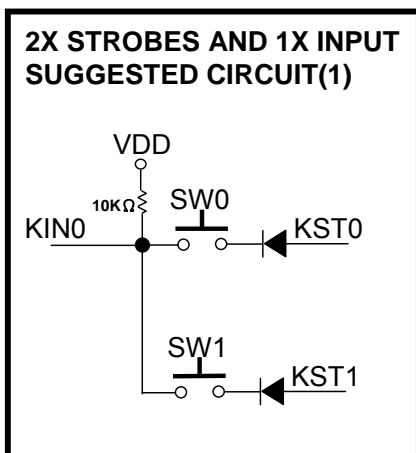


Figure-2-1

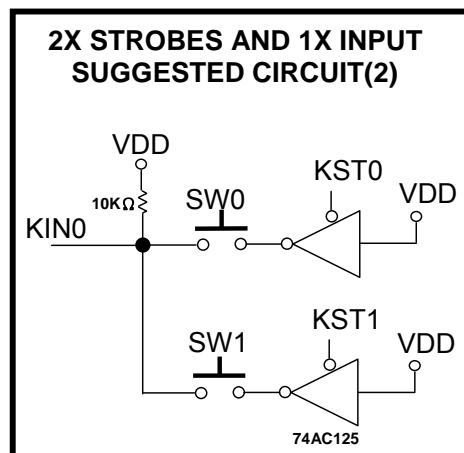


Figure-2-2

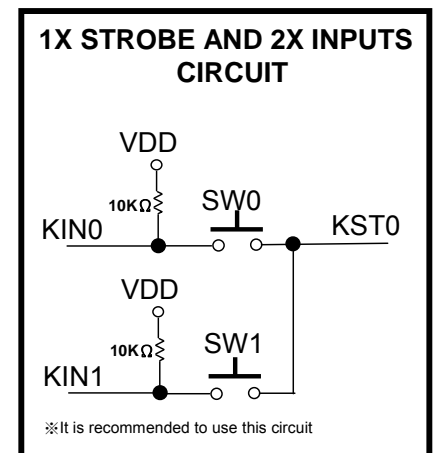


Figure-2-3

Question 2: What is the duration of reset pulse after power-on with RA8816?

Answer: The duration of reset pulse after power-on should be more than 5ms.

回覆：Power-on 後的 Reset pulse 週期必須大於 5ms。

Question 3: Datasheet doesn't specifies if RST is standard logic input pin or if it has some hysteresis included (Schmitt trigger input) to allow slow rise and falling edges on RST signal. Can RA8816 be reset by simple RC circuit?

Answer: The /RST pin of RA8815 and RA8816 is a Schmitt trigger reset input and active low, it can be reset by a simple external RC circuit as the Figure-3.

回覆：RA8815以及RA8816的/RST pin為低準位輸入的Schmitt trigger架構，如下圖三，其可被reset經由一個簡單的外部RC電路。

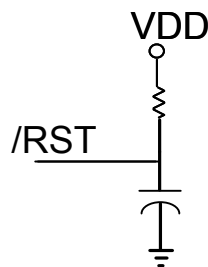


Figure-3

Question 4: Why did we get a failure output when we made an auto-scroll function to the picture which is greater than 48 display lines?

Answer: If the register "MWMR" of RA8816 [Memory Write Mode Register] is only set to "normal display range", then the auto-scroll function will be worked well. But depend on the design for RA8816, if the "MWMR" is set to "display range + scroll-buffer" or "scroll-buffer" will cause a wrong display pattern when the scrolling range is greater than 48 pixels in vertical direction. In this case, please refer to the following program to solve above application issue.

回覆：如果 RA8816 的暫存器"MWMR"單純被設定為"normal display range"，則自動捲動功能可正常顯示。但依照 RA8816 的設計，若"MWMR"是被設定為"display range + scroll-buffer"或"scroll-buffer"，當其的捲動範圍是大於 48 個垂直顯示 pixel，將會造成錯誤的顯示畫面。在此類的情況下，請參考以下的程式來排除上述的應用問題。

```
void display_scroll-buffer(void)
```

```
{
```

```
    uchar temp, i, j;
```

```
//the following related functions please refer to the demo-code of RA8816 from RAiO's website
```

```
LCD_Initial();
LCD_Clear();
Delay100ms(1);
LCD_ON();

LCD_CmdWrite(SWSXR, B0000_0000);
LCD_CmdWrite(SWSYR, B0000_0000);
LCD_CmdWrite(SWRXR, 17);
LCD_CmdWrite(SWRYSR, 63);
LCD_CmdWrite(ASCR, B0011_0000);
LCD_CmdWrite(SCCR, B0010_1110); //Set Scroll Range

LCD_CmdWrite(MWMMR, B0011_0011); //set normal display range (memory range of write)
LCD_CmdWrite(SCCR, B0110_1110);

LCD_GotoXY(0, 0);
LCD_PrintStr(sRAiO28, 2);
Delay100ms(10); //write data to show
LCD_GotoXY(0, 16);
LCD_PrintStr(sRAiO29, 4);
Delay100ms(10);
LCD_GotoXY(0, 32);
LCD_PrintStr(sRAiO30, 6);
Delay100ms(10);
LCD_GotoXY(0, 48);
LCD_PrintStr(sRAiO31, 8);
Delay100ms(10);
LCD_GotoXY(0, 0x40); //write data in display+buffer memory
LCD_PrintStr(sRAiO32, 10);
Delay100ms(10);

LCD_CmdWrite(MWMMR, B0111_0011); //set display+scroll-buffer (memory range of write)
LCD_CmdWrite(SCCR, B1111_1010);

j = 0;

while(1)
{
    LCD_GotoXY(0, 0); // (A) write data in buffer memory
```

```
LCD_DataWrite(0xa3);
LCD_DataWrite(0x41 + j);
j++;

//(1)
LCD_CmdWrite(SCCR, B0001_1100);           //set direction
for(i=0; i<64 ; i++)                       //(B)scroll 64 lines
{
LCD_CmdWrite(SCOR, i);
Delay100ms(2);
}

//(2)
LCD_CmdWrite(SCCR, B0001_1000);
for(i=16; i>0 ; i--)                       //(C)scroll 16 lines
{
LCD_CmdWrite(SCOR, i);
Delay100ms(2);
}
}
Delay100ms(200);
}
```

Question 5: Is there any software command to reset RA8815/RA8816 instead of hardware reset (RST)?

Answer: Yes, RA8815/RA8816 provides software reset function instead of hardware reset circuit (SRST: bit 7 of PWRR). Set SRST bit to 1, all of the register will be initialed again except the display memory. Once this bit is set to 1 then RA8815/RA8816 has to take 50us for operation and cannot accept any new command from MCU. If the SRST bit is cleared to 0, then RA8816 will do its normally display operation.

回覆：是的，RA8815/RA8816提供一軟體重置功能以取代硬體的重置電路 (SRST: bit 7 of PWRR)。將SRST這個位元設定為1，除了顯示記憶體之外，全部的暫存器將被重新初始化。一旦這個位元被設定為1之後，RA8815/RA8816必須經過50微秒來完成重置的動作，在這一段其間其不能接受任何來自於MCU的指令。若將SRST位元清除為0，則RA8816將會進行其一般地顯示工作。

Question 6: How to choose the resistor value for the internal RC oscillator of RA8815 which be connected between pins RA and RB of RA8815?

Answer: The system clock of RA8815 is generated by the internal oscillation circuitry and it needs an external resistor which is connected between pin RA and RB. Normally, the resistor value is 270Kohm and generated frequency is around 45 KHz.

回覆：RA8815 的系統頻率是產生自內部的振盪電路，但其需要一個接在 RA 與 RB pin 之間的外部電阻。一般來說，在電阻值為 270Kohm 的情況下，其產生的振盪頻率大約是 45KHz。

Question 7: How to choose the capacitor value for the bias circuit of RA8815/RA8816?

Answer: All of the capacitors at the Figure-4 are recommended to use 1uF.

回覆：如圖 4，所有的電容值是建議使用 1uF。

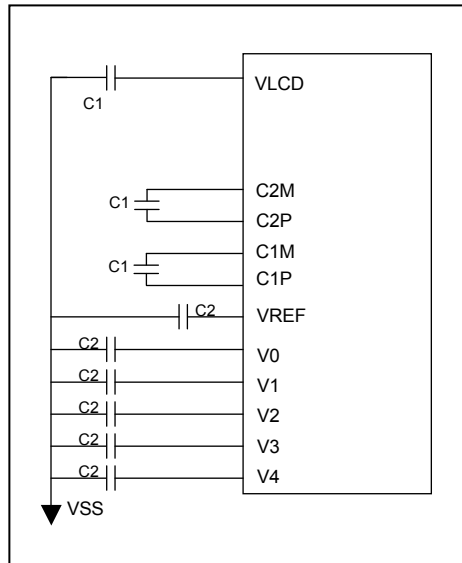


Figure-4 (3X Set-up Voltage Circuit)

Question 8: For RA8815, between the issues of two different commands or data, is it necessary to add a delay time and how long is the delay time will be recommended to use?

Answer: Because of the system clock of RA8815 is generated by the internal circuit and external resistor, the resistor is connected between pin RA and RB. Normally the resistance is recommended to use 270Kohm and the clock frequency will be around 45 KHz. When the serial interface is using, user has to heed that the data access speed to RA8815 can not be too fast, that's because the RA8815 needs a little time to process the received command or data. To access RA8815, we would like to suggest user to add a delay time between two sequential commands or data to avoid the wrong access problem. The recommended delay times are following below.

1. The delay time is recommended more than 2T (2 x (1/system clock)) when writing the sequential commands or data to RA8815. For example, If system clock = 55 KHz, then the delay time has to be more than 35us.
2. The delay time is recommended more than 17T (17 x (1/system clock)) when accessing the 8x8/8x16 Half Size Font from RA8815. For example, If system clock = 55 KHz, then the delay time has to be more than 0.35ms.
3. The delay time is recommended more than 33T (33 x (1/system clock)) when accessing the 16x16 Full Size Chinese Font from RA8815. For example, If system clock = 55 KHz, then the delay time has to be more than

0.7ms.

回覆：由於 RA8815 內部 RC 所產生的 system clock，以外部電阻為 270KΩ 而言，system clock 只有 45KHz 左右，若外部的 MCU 給 command/data 間隔太近的話，將可能導致 RA8815 無法確實接收來自 MCU 的指令或資料。所以我們會建議在相關的條件下，增加一 delay time，以避免 RA8815 出現錯誤存取的問題。

以 System clock=45KHz 為例:

1. 連續兩筆 Command read/write 的 delay time 建議大於 2T(兩倍的 RA8815 system clock cycle), delay time 的建議值為大於 35uS。
2. 連續兩筆讀取 8x8/8x16 Half Size Font 的 delay time 建議大於 17T(17 倍的 RA8815 system clock cycle), delay time 的建議值為大於 0.35mS
3. 連續兩筆讀取 16x16 Full Size Chinese Font 的 delay time 建議大於 33T(33 倍的 RA8815 system clock cycle), delay time 的建議值為大於 0.7mS