

UNIDIM

REV. A

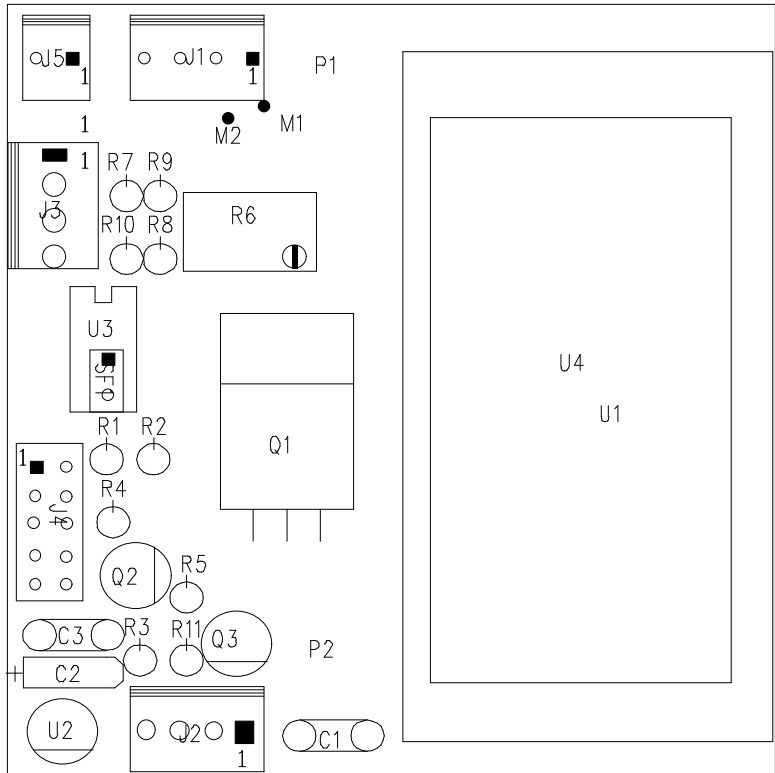
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1. LAYOUT



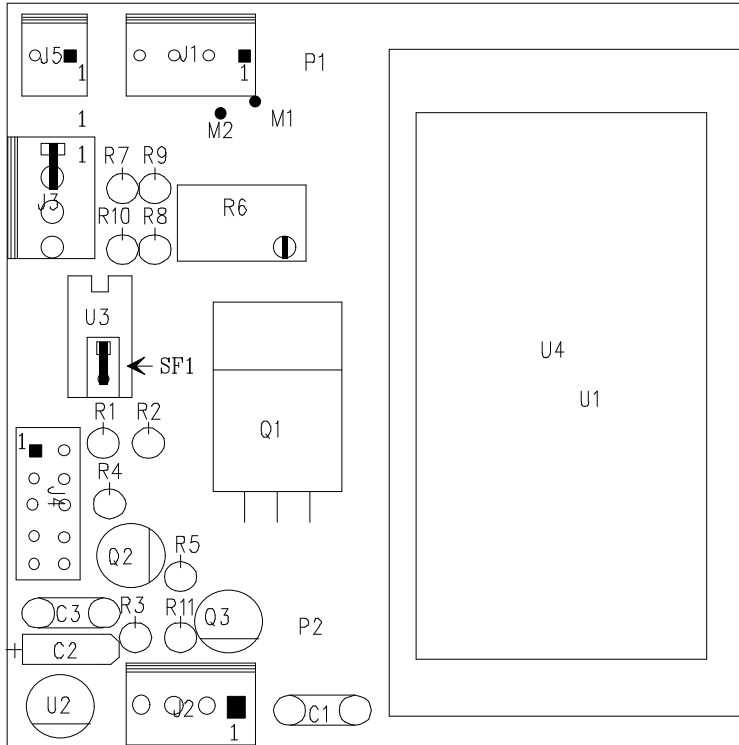
2. GENERAL

The UNIDIM product is intended to light (or drive) LCD panels with up to 2 backlights. It does this through the use of a single DC-to-AC inverter. This product has the capability to support 2 uniquely different footprints of inverters (shown above as U1 or U4). The factory installed inverter used vary depending on panel/backlight manufacturer specifications (such as the number of bulbs to drive, ionizing voltage, operating current/voltage, etc.).

3. CONFIGURATION

The UNIDIM can be used to drive backlights for LCD panels with three possible modes of brightness control. The base configuration for brightness control utilizes an on-board potentiometer. An optional method is to use a remote potentiometer. The third choice for brightness control involves installing a digitally-controlled potentiometer that can be controlled by your applications software. All three configurations will be discussed.

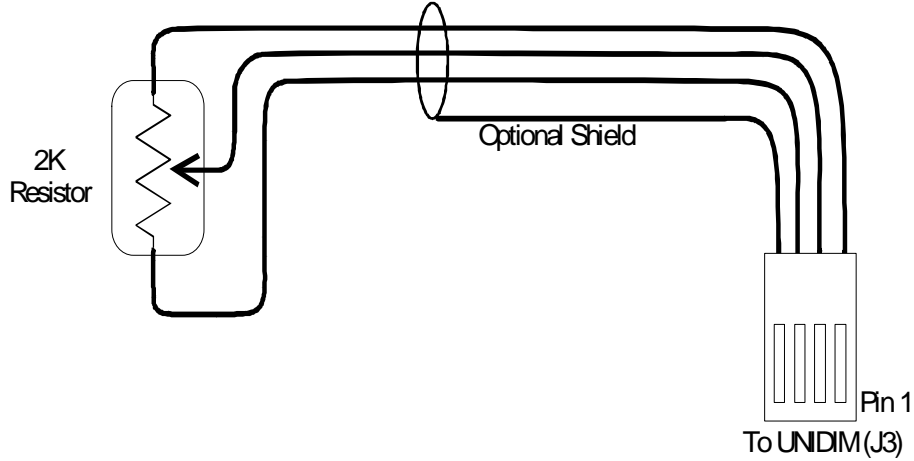
3.1 Standard Configuration: On-board Potentiometer



The standard backlight configuration uses the on-board potentiometer, R6, for brightness control. This control is effectively a drive/overdrive adjust. This method has two jumpers installed; one shorting J3-1 to J3-2, the other installed in SF1 (U3 not installed). NOTE: If you adjust R6 too far in dimming the backlight, the inverter may not deliver the proper start-up voltage to light the backlight at the next system power-up.

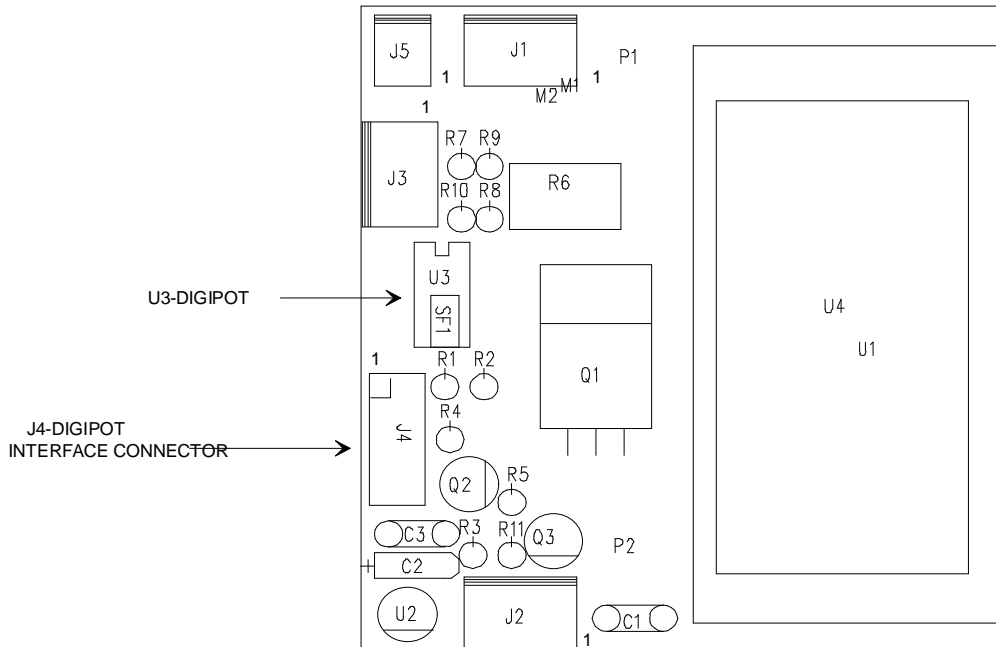
3.2 External Brightness Control

Should the user opt for an external brightness control, remove the jumpers from SF1 and J3 and connect a 2K variable resistor to J3 as shown:



3.3 Digipot Brightness Control

A third alternative for brightness control is the implementation of a EE-POT (digitally controlled potentiometer). This device is installed to enable brightness control via a computer or digital controller.



J4 is the input connector for the EE-POT. The EE-POT requires three input signals to control the brightness of the backlight ; INC(Increment Count), U/D(Up Direction/Down Direction) and CS(Chip Select). When CS is TTL-logic-low it enables the other two inputs. When CS is brought to a TTL-logic-high while INC is high, the last value of the device is saved in a non-volatile memory built into U3. The U/D input determines the direction of adjustment when the INC line is pulsed.. If U/D is TTL-logic-low, the device value is decremented. If U/D is TTL-logic-high, the device value is incremented. The standard device is a 100-count 10Kohm potentiometer making each increment equal to 100 ohms. The actual operating range is going to be a function of bulb start-up and operating voltages.

3.4 EE-POT control software example

```

/*
 * name      : PotClock
 * synopsis:  Toggles the counter on the pot by the value of clocks. The
 *            sign of clock indicates up or down count. Note that the pot
 *            count sticks at the extremities (i.e. it does not roll).
 * entry    :  clocks is the number of steps to increment.
 * globals  :  NONE
 */
void PotClock( int clocks )
{
    UCHAR      reg;
    clock_t done;

#define _CS          0x01
#define _UP          0x04
#define INC          0x08
#define LPT1_DATA   0x0378

    /* Initialize register with everything on.          */
    reg = INC | _UP | _CS;

    /*
     ** Determine direction of count. Negative number indicates a decrement;
     ** clr U/!D for decrement.
     */
    if( clocks < 0 )
    {
        reg &= ~_UP;
        clocks = -clocks;
    }

    /*
     ** Output initial state to LPT port, then clr !CS to enable clocking.
     ** Chip MUST see this hi - lo transition on !CS to work properly.
     */
    outportb( LPT1_DATA, reg );
    reg &= ~_CS;
    outportb( LPT1_DATA, reg );

    /* Toggle loop; switch state of !INC clocks times...          */
    do
    {
        reg &= ~INC;
        outportb( LPT1_DATA, reg );

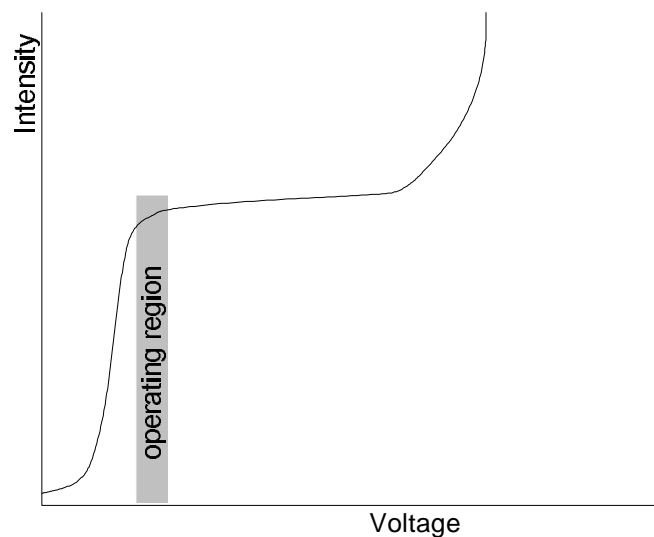
        reg |= INC;
        outportb( LPT1_DATA, reg );
    }
    while( --clocks > 0 );

    /*
     ** Now set !CS to latch new pot output; done and exit.
     */
    reg |= _CS | INC;
    outportb( LPT1_DATA, reg );
}

```

3.5 Backlight Overdrive Adjust

In order to provide sufficient startup voltage to the backlights, some inverters output a higher than required operating voltage under normal loading. This results in a slightly brighter display, but may shorten the life of the bulbs used in the panel backlight assembly. To avoid this effect, an adjustment has been provided (R6). The purpose of the adjustment is to operate the backlight bulb safely (without overdriving it) and still provide maximum brightness. This same adjustment is used as the on-board brightness control. NOTE: If you adjust R6 too far, the inverter may not deliver the proper start-up voltage to light the backlight at the next system power-up.

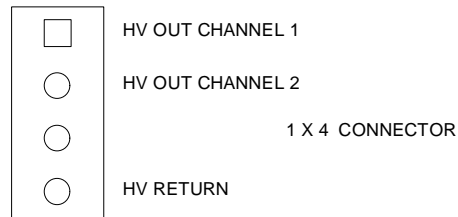


3.5.1 Overdrive Adjust Procedure

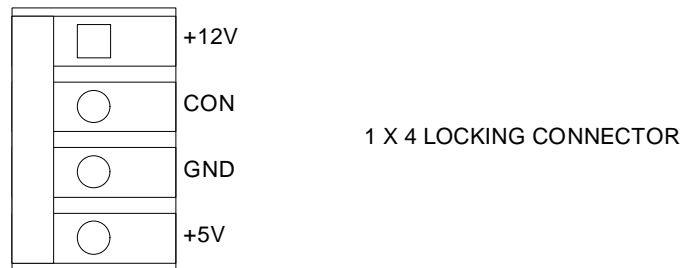
Connect the UNIDIM to the panel which will be used in the system being assembled. Adjust the external adjust device (EE-POT or external element) for maximum brightness. Note that initially R6 may need adjustment to bring the backlights up. Once maximum brightness is achieved, slowly adjust R6 until the backlights start to dim. This should be the desired operating point of the backlights as shown above.

4. CONNECTOR SUMMARY

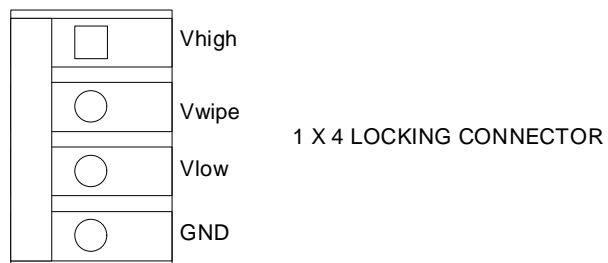
4.1 J1 (High Voltage Output)



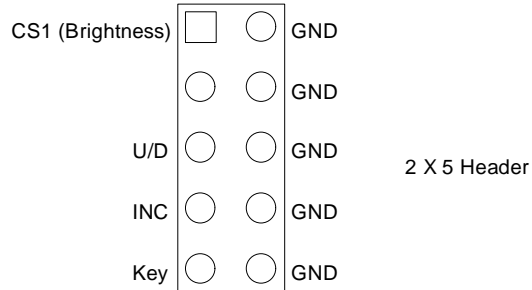
4.2 J2 (Power Input)



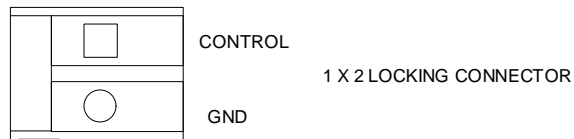
4.3 J3 (External Control Element)



4.4 J4 (EE-POT Control)



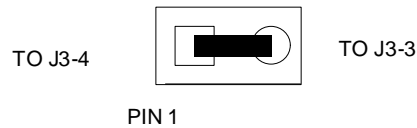
4.5 J5 (Backlight On/Off Control)



Power consumption and heat are a major concern in any display system. The UNIDIM offers a solution that allows the user to turn off the backlights when not needed. The Control pin of J5 (J5-1) is normally a digital high. In this condition the backlights function normally. When a signal is applied that takes this pin to a digital low or ground, the control circuitry turns off the backlight only. All processing functions continue. J5 can be interfaced by either a remote switch closure or by software control.

5. STRAPPING FIELD SUMMARY

5.1 SF1 (On-Board Brightness Control)



SF1 is strapped if the on-board brightness control is to be used. Also a jumper is installed from J3-1 to J3-2. If any external control is to be used, these 2 jumpers are removed.

5.2 M1-M2 (Inverter High Current Mode)

M1 and M2 are plated holes that are for factory configuration only. These parallel the two high voltage outputs of the inverter for a higher current mode. It is recommended that the user not modify the factory configuration as shortened bulb life or damage to the inverter may result.