

Lumencor Light Engine Electrical Interface with TTL (DB-15HD) and RS-232 7 Channel

This document describes the interface and control of the Light Engine using the TTL on/off enables and the enables and intensity control via RS-232/(optional USB). This document applies to the (7) channel units.

1.1 TTL and RS-232 Connector Pinouts and Signals.

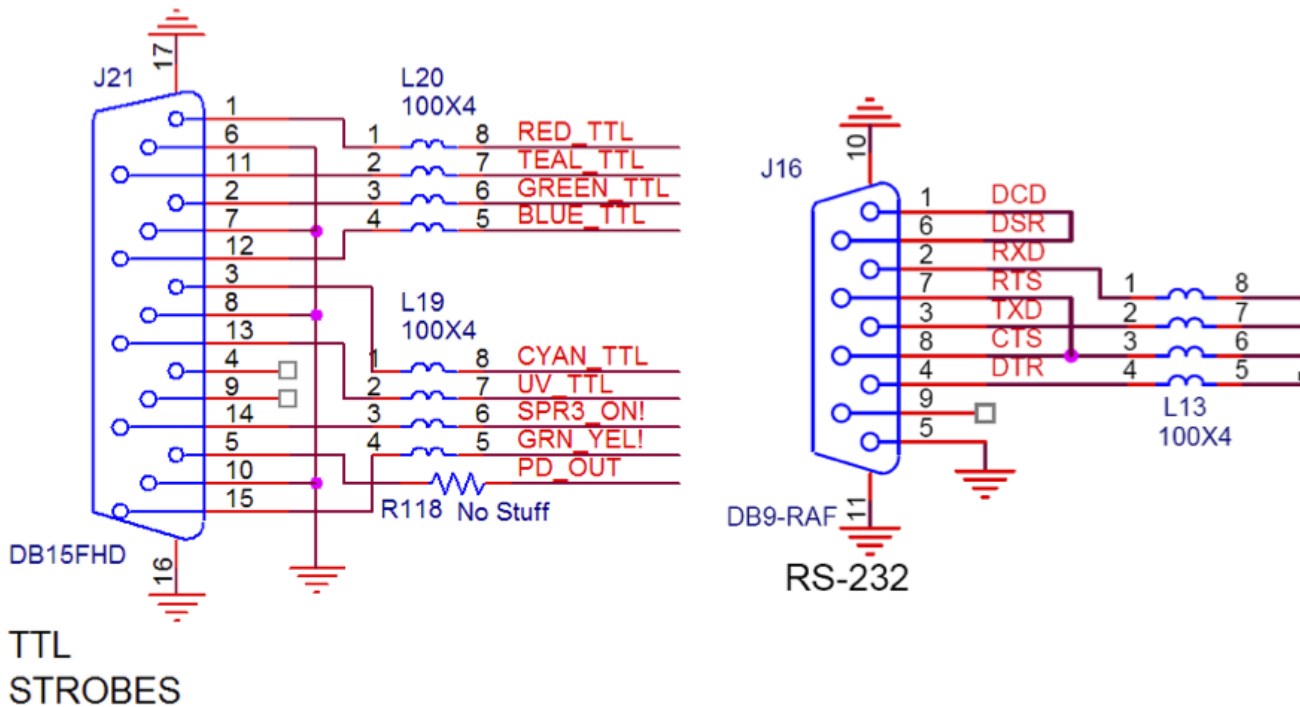


Figure 1

TTL: See figure 1 for TTL (5V/3.3V optional) enable color channel pin mapping. These signals are active low (i.e., a low enables or turns on a channel, a high disables or turns off a channel) with internal pull-ups compatible with an open-collector or bipolar drive.

Alternatively, there is a provision to invert the polarity of these TTL enables. (Active hi with internal pull-down) This is configured by Lumencor at time of manufacture and is not user selectable. The default configuration for these TTL enables are active low.

RS-232: See figure 1 for RS-232 Pinout. Pin 2 is host RX, pin 3 host TX. Default port parameters are 9600,8,N,1. This port can control both enables and intensity of each channel. Using an USB->RS-232 Adapter, (optional) USB controlled enables and intensities are also provided. See section 1.X.2 for the RS-232 command structure and bit definitions.

1.2 RS-232 Command Strings and Bit Definitions.

The following section defines the command strings and bit assignments. Bytes #s and bit #s are LSB=0. Bytes are expressed as hexadecimal. Bits not specifically defined here should remain as shown in the examples.

Initialization Command String for RS-232 Intensity and RS-232 OR TTL Enables:

The first two commands MUST be issued after every power cycle to properly configure controls for further commands.
57 02 FF 50- Set GPIO0-3 as open drain output
57 03 AB 50- Set GPIO5-7 push-pull out, GPIO4 open drain out

Channel Enable Command String:

Byte 1, Bit 0, controls Red. 0 enables, 1 disables.
Byte 1, Bit 1, controls Green. 0 enables, 1 disables.
Byte 1, Bit 2, controls Cyan. 0 enables, 1 disables.
Byte 1, Bit 3, controls UV. 0 enables, 1 disables.
Byte 1, Bit 5, controls Blue. 0 enables, 1 disables.
Byte 1, Bit 6, controls Teal. 0 enables, 1 disables.

Examples:

4F 7E 50- Enables Red, Disables Green,Cyan,Blue,UV,Teal
4F 7D 50- Enables Green, Disables Red,Cyan,Blue,UV,Teal
4F 7B 50- Enables Cyan, Disables Red,Green,Blue,UV,Teal
4F 5F 50- Enables Blue, Disables Red,Green,Cyan,UV,Teal
4F 77 50- Enables UV, Disables Red,Green,Cyan,Blue,Teal
4F 3F 50- Enables Teal, Disables Red,Green,Cyan,Blue,UV
4F 7F 50- Disables All.
4F 5B 50- Enables Cyan and Blue, Disables all others.
4F 3E 50- Enables Red and Teal, Disables all others.

Green/Yellow Filter Select Command String:

Byte 1, Bit 4, controls Green/Yellow filter selection. 0 selects Yellow Filter, 1 selects Green Filter.

Examples:

4F 7D 50- Enables Green, Disables Red,Cyan,Blue,UV,Teal.
Selects Green Excitation Filter.
4F 6D 50- Enables Green, Disables Red,Cyan,Blue,UV,Teal.
Selects Yellow Excitation Filter.

IIC DAC Intensity Control Command Strings:

Byte 5 is the DAC IIC Address. Red, Green, Cyan and UV use IIC Addr = 18. Blue and Teal use IIC Addr = 1A.

Byte 3, Bit 3, selects RED DAC if IIC Addr =18. 1 selects.
Byte 3, Bit 2, selects GREEN DAC if IIC Addr =18. 1 selects.
Byte 3, Bit 1, selects CYAN DAC if IIC Addr =18. 1 selects.
Byte 3, Bit 0, selects UV DAC if IIC Addr =18. 1 selects.
Byte 3, Bit 1, selects TEAL DAC if IIC Addr =1A. 1 selects.
Byte 3, Bit 0, selects BLUE DAC if IIC Addr =1A. 1 selects.

Byte 2, Bits 3..0, Contain the high nibble of 8-bit DAC data. Byte 1, Bits 7..4, Contain the low nibble of 8-bit DAC data.

Note- this 8-bit data is inverted. 0xFF is full off, 0X00 is full on.

Examples:

```
53 18 03 0F FF F0 50- Sets R,G,C,U DACS to 0xFF (Full off)
53 18 03 0F F0 00 50- Sets R,G,C,U DACS to 0x00 (Full on)
53 18 03 01 FA A0 50- Sets UV DAC to 0xAA
53 18 03 02 F5 50 50- Sets CYAN DAC to 0x55
53 18 03 04 F8 00 50- Sets GREEN DAC to 0x80
53 18 03 08 F6 60 50- Sets RED DAC to 0x66
53 1A 03 01 F4 40 50- Sets BLUE DAC to 0x44
53 18 03 05 F2 20 50- Sets UV and GREEN DACS to 0x22
53 1A 03 02 F6 60 50- Sets TEAL DACS to 0x66
```

Read IIC Temp Sensor Strings:

The IIC Temperature Sensor can be read with the following command string:

```
53 91 02 50- Reads the IIC Temp Sensor
```

Two bytes should be returned which contains the temperature data. The most significant 11 bits of the two bytes are used with a resolution of 0.125 deg C.

Examples:

```
[TX] 53 91 02 50- Command String to the IIC Temp Sensor.
[RX] 26 A0- Two bytes returned from Temp Sensor.
```

```
26 A0 (hex) = 0010 0110 1010 0000 (binary).
1st 11 MSb = 001 0011 0101 (binary)
001 0011 0101(b) = 135(h) = 309(decimal)
309 * 0.125 = 38.625 deg C.
```