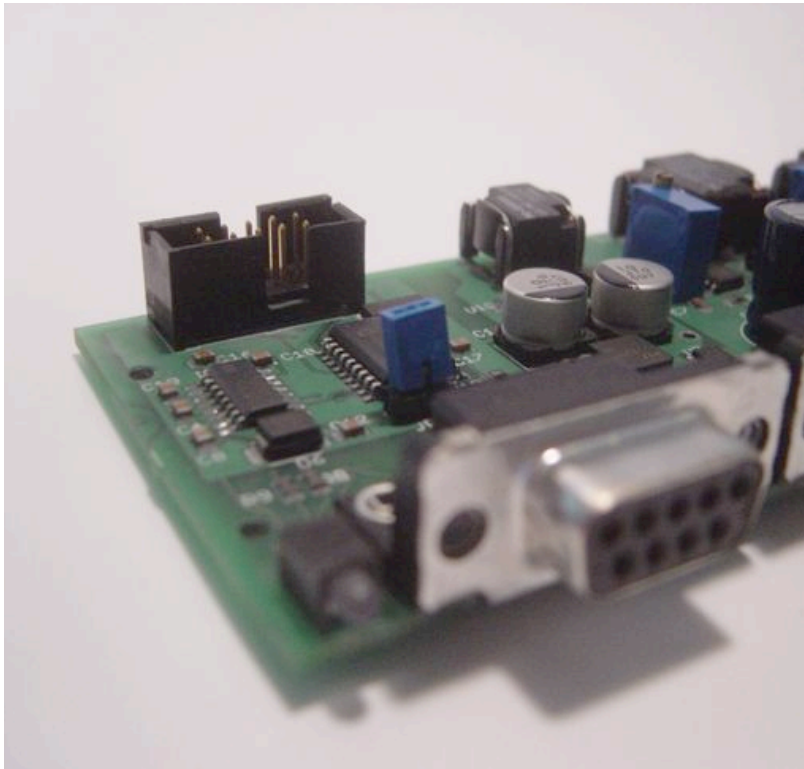


PIXCELL

Programmable LED driver

P/N UPM100



The Pixcell is designed as an integrated solution to power and control multiple chains of LEDs up to 60W in power.

The Pixcell module can simultaneously power and control three separate chains of LEDs. Typically, the Pixcell is connected to a multiple red, green and blue LEDs. An embedded microcontroller is preprogrammed with firmware to control the intensity of each chain of LEDs independently using pulse-width modulation.

The Pixcell has three on-board constant-voltage sources capable of providing up to 48V at 500mA. The microcontroller has two distinct interfaces, RS-232 communication and three opto-isolated inputs.

The included firmware provides for on- and off-line control of the LEDs intensity. The serial data link provides for continuous and realtime control of the LED intensity. When no serial data is detected, the microcontroller begins to respond to the opto-isolated inputs. In this mode, the three opto-isolated inputs allow eight different intensity combinations to be accessed.

Input Characteristics

| | | |
|--------------------|---------|----------------------------|
| Power Input | voltage | 48V nominal |
| Serial Data Input | | conforms to EIA-232 levels |
| Optoisolated Input | voltage | 16V max, 5V min |

Output Characteristics

| | | |
|--------------------------|-----------------------|--|
| Constant Voltage Sources | trim range current | 5V - 48V each channel 0-500mA per channel |
|--------------------------|-----------------------|--|

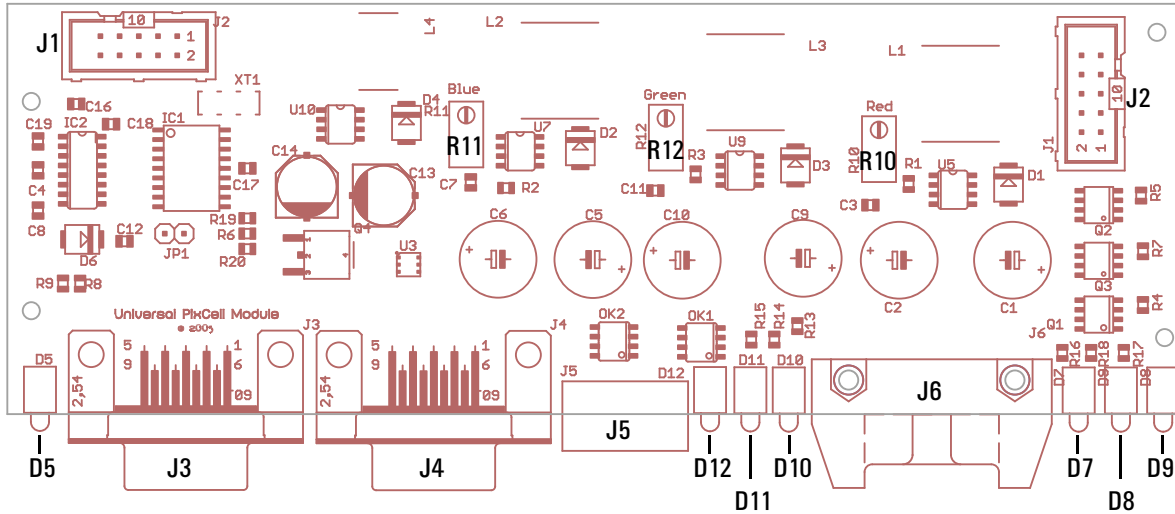
Microcontroller Characteristics

| | |
|-----------------------|-----------------|
| Microchip part number | 16F648A |
| Flash program memory | 4K instructions |
| Random access memory | 256 bytes |
| Non-volatile memory | 256 bytes |

Dimensions

| | |
|------|-----------------|
| size | 6.125" x 2.125" |
|------|-----------------|

Fig 1. Physical Layout.



CONNECTORS

J1 - Voltage Programming Port

- 1: V_{f1}
- 2: V_{f2}
- 3: V_{f3}
- 4: GND

J2 - ICSP Port

- 1: V_{cc} (+5V)
- 6: PGD
- 8: PGC
- 10: V_{pp}
- 7, 9: GND

* This port is compatible with the ICSP connector on the BK Precision 844A

J3 - Power/Data Input

- 1, 2, 6: +48V In
- 5, 4, 9: GND
- 8: Serial Data In

J4 - Power/Data Output

- 1, 2, 6: +48V In
- 5, 4, 9: GND
- 8: Serial Data Out

J5 - Optoinputs

- 1: Optoinput Common
- 2: Optoinput 1
- 3: Optoinput 2
- 4: Optoinput 3

J6 -LED Outputs

- 1: V_{f1}
- 3: V_{f2}
- 5: V_{f3}
- 2, 4 6: V_{common}

INDICATORS

D5 - Power Good/Signal Good

- Green : Power and Signal Good
- Yellow : Power Good, No signal at J3.8

D12 - Optoinput 1

- Off : No voltage at J5.2
- Green : Signal detected at J5.2

D11 - Optoinput 2

- Off : No voltage at J5.3
- Green : Signal detected at J5.3

D10 - Optoinput 3

- Off : No voltage at J5.4
- Green : Signal detected at J5.4

D7 - V_{f1} Out

- Off : V_{f1} deactivated
- On : V_{f1} energized

D8 - V_{f2} Out

- Off : V_{f2} deactivated
- On : V_{f2} energized

D9 - V_{f3} Out

- Off : V_{f3} deactivated
- On : V_{f3} energized

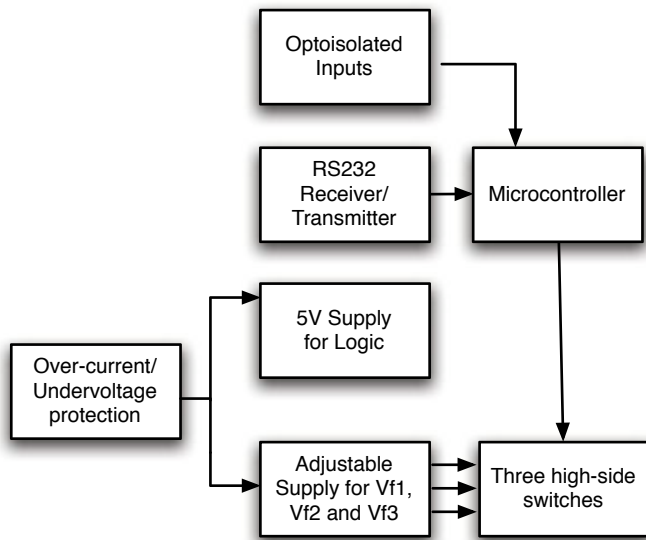
POTENTIOMETERS

R10 - V_{f1} Adjust

R12 - V_{f2} Adjust

R11 - V_{f3} Adjust

Fig 2. Functional Block Diagram



Programming

The Pixcell module includes a user-modifiable microcontroller. Reprogramming is accomplished through a simple In-Circuit Serial Programming (ICSP) port on the Pixcell module.

Firmware

The Pixcell is proloaded with a basic firmware. This firmware reads a serial data stream and sets three 9-bit software PWMs to control the intensity of the attached LEDs. Furthermore, if the serial data stream is interrupted, the microcontroller checks the optoisolated and sets the PWM outputs to one of eight different intensity combinations stored in the non-volatile memory.

New firmware may be created by any standard method and the entire microcontroller is available for reprogramming.