

WZ1243

WIZpix: Internet-Connected Pixel Controller



WIZpix is an internet enabled RGB pixel controller with built in PoE. It's intended uses include indoor Christmas trees and holiday decorations, stage lights and props for musical and theatrical shows, store signage and display, and many more.

WIZpix uses the WIZnet W5500 internet appliance to connect to internet and MSP430F5172 MCU to control RGB pixels. Built-in DC/DC converter allows use of PoE, which eliminates need for directly connected power supply, ability to place controller far away from the outlet, and use of only one inexpensive CAT-5 cable.

WIZpix was designed to control WS281x one-wire protocol addressable pixels. DC/DC converter is capable of delivering 5V@2.5A, which means up to 50 RGB pixels can be used with PoE power. Maximum PoE input voltage is 48V. When power jack is used, up to 250 pixels can be connected.

The idea to create this device was born 2 years ago, when I first used RGB lights on my Christmas tree. Looking at ways to control this device, I had several options to choose from: UART, USB, WiFi, RF, and Ethernet. After careful consideration, I have decided that Ethernet offered many advantages over other options. When WIZnet announced 2014 Design Challenge, I figured this is the time to realize my idea.

Currently implemented software allows control of built-in animations as well as control of individual LEDs simply by sending HTTP requests to the board. For example, to play animation #1, you simply use a?n=01 query string (a is “set animation” command and n is “number” parameter.) Animations can be paused and resumed, direction can be changed. Animations can also have additional parameters, for example you can choose which color to use for sparkle effect. Simple HTML or a more advanced AJAX page could be used as a GUI front end with buttons, sliders, etc.

Future software implementations will include:

- remote configuration
- support for real time data display via UDP streaming
- mixing of animations, speed control, and custom animations (custom animations will be written to EEPROM, which is already included on WIZpix board)
- support for Bonjour and mDNS

Example commands:

<http://192.168.168.43/o> - all off

<http://192.168.168.43/s> - stop animation

<http://192.168.168.43/p> - resume animation

<http://192.168.168.43/r> - reverse animation

<http://192.168.168.43/a?n=03> - play animation #3

<http://192.168.168.43/?n=0f&r=ff&q=ff&b=ff> - set LED #0x0F to RGB=0xFF, 0xFF, 0xFF



