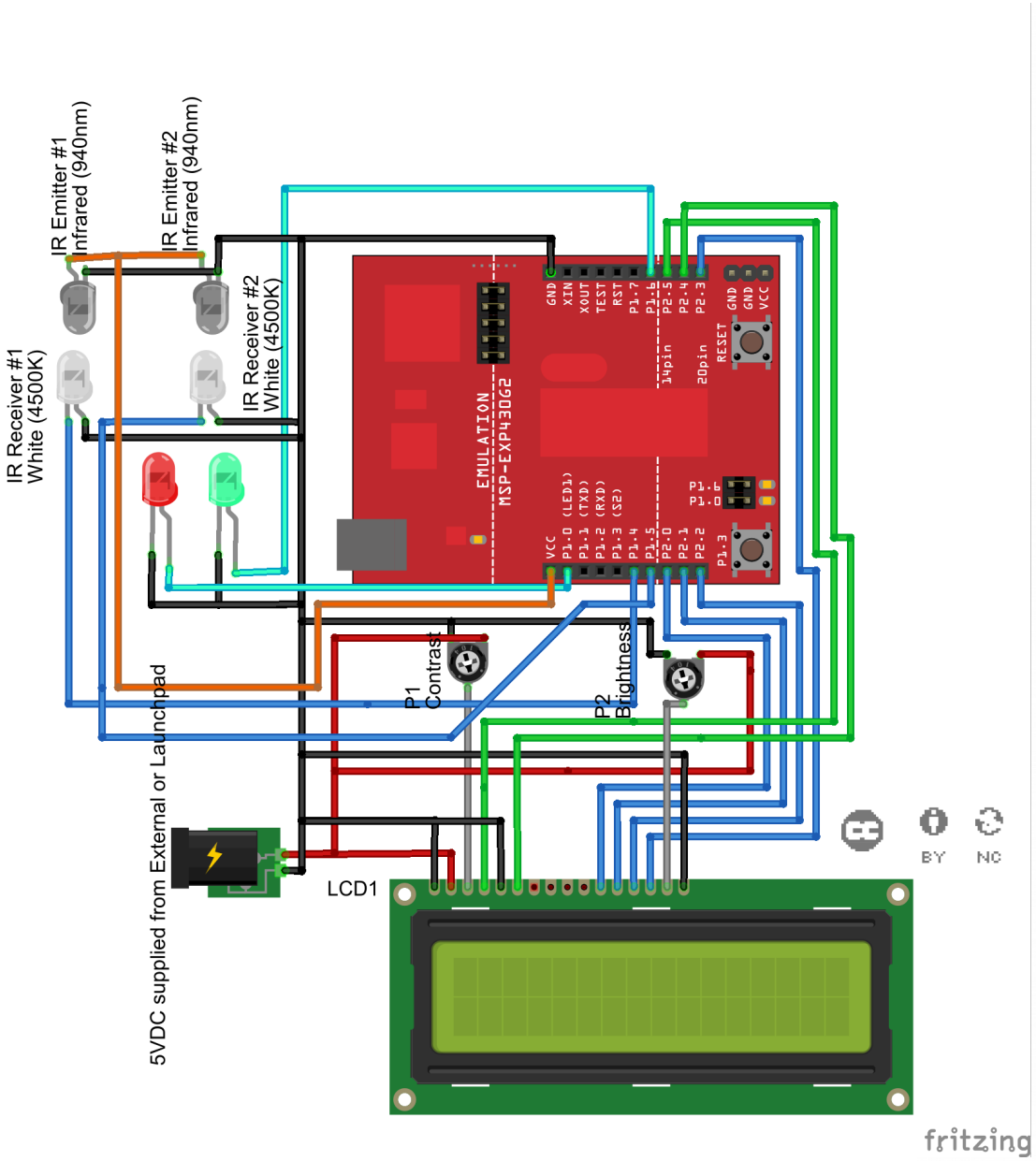
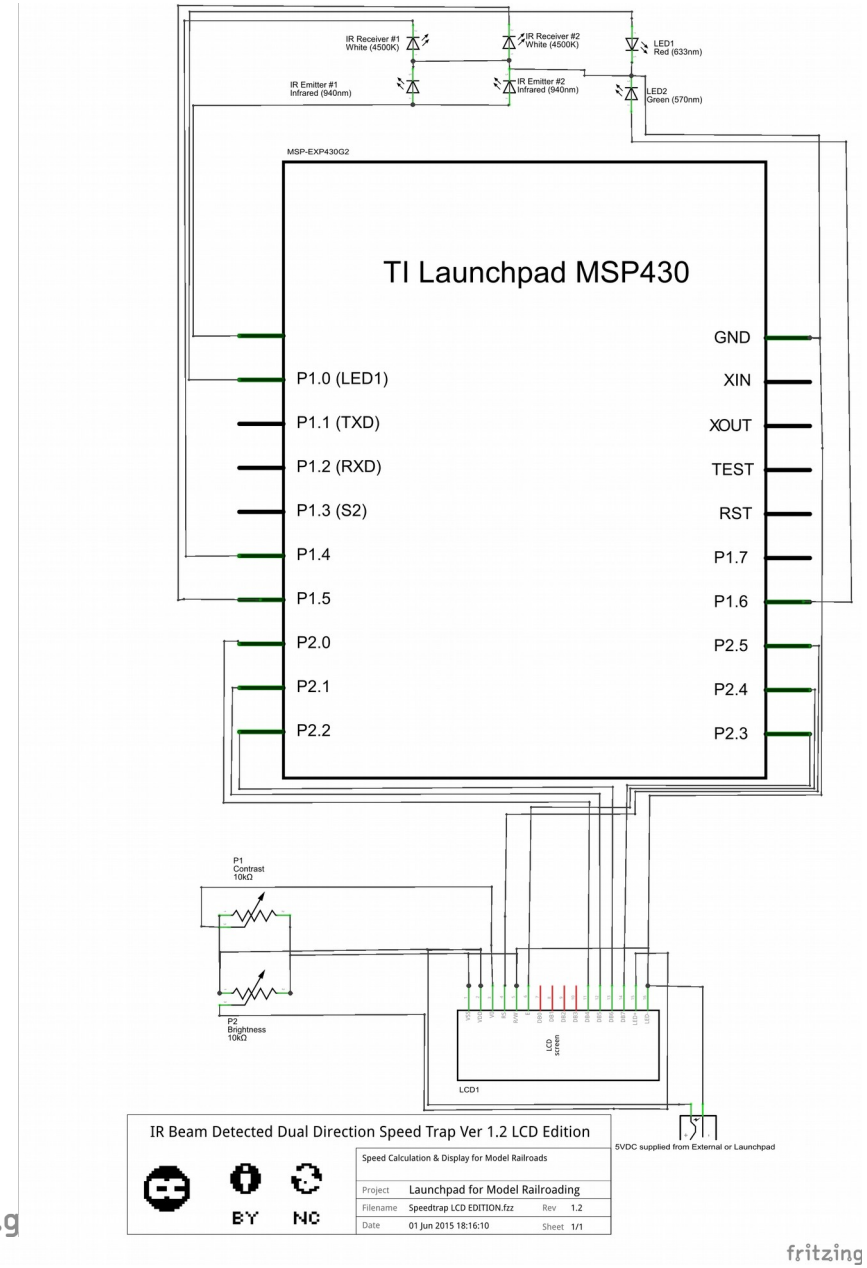
Project Layout & Schematic – IR Beam Detected Dual Direction Speed Trap Ver. 1.2 LCD Edition
Schematic Revised 6/1/2015





****** TAKE CAREFUL NOTE: The IR receivers connect to ground differently than the emitters ******

IR Beam Detected Speed Trap (Single Track Version) Version 1.2 LCD Edition

CREDITS:

Speed calculations & initial concept coding by: Toni Ryan
IR Beam Detection & LCD Integration by: S.D. "Hoffy" Hofmeister
LCD Library (lcdLib.h & lcdLib.c) The University of Texas at El Paso -
College of Engineering: http://www.ece.utep.edu/courses/web3376/Lab_5_-_LCD.html
Elliott Gurrola, Luis Carlos Bañuelos-Chacon, Elias N Jaquez
This code is a group source project through The Launchpad for Model Railroading Project
- http://launchpad4mrr.blogspot.com/

TARGETED TO MSP430 LANUCHPAD W/MSP430G2553 PROCESSOR

Design Notes:
This code is designed to to trigger a speed calculation for a model train passing through 2 IR beam Sensors.
The code is designed to take a "speed reading" or "Time Count" in both directions.
Distance between Tip of IR Emitter and Tip of Detector has only been tested up to 3.5 Inches under incandescent and fluorescent lighting conditions with no failures.
LCD Coding is designed for a QC1602A Ver 2.0 LCD Module
A Data sheet for the LCD is contained within this package. An equivalent 3.3V display can be used instead, but
was unavailable to me at the time of this projects development.
Circuit Pinout:

PIN 1.0 = RED INDICATOR LED
PIN 1.1 = UNASSIGNED - UART
PIN 1.2 = UNASSIGNED - UART
PIN 1.3 = UNASSIGNED
PIN 1.4 = Cathode of IR Beam Receiver #1 > Anode to Ground
PIN 1.5 = Cathode of IR Beam #2> Anode to Ground
PIN 1.6 = GREEN INDICATOR LED
PIN 1.7 = UNASSIGNED
PIN 2.0 = LCD D4
PIN 2.1 = LCD D5
PIN 2.2 = LCD D6
PIN 2.3 = LCD D7
PIN 2.4 = E (Enable)
PIN 2.5 = RS (Register Signal)

Installation of Code Project:

This package contains a Code Composer Studio Ver. 5 Export. This project contains additional files and header files which must compile along with the code itself in order for the LCD to work.

Follow the instructions on importing a project in Code Composer Studio.

Parts List:

Qty Description

1 LCD 16 Character 2 line Display 1602A – an equivalent to the one used in my prototype can be found at https://www.sparkfun.com/products/709 however search the internet for 1602A 16x2 LCD may turn up better deals.
Mine were acquired through eBay rather cheap.

2 Infrared LED Emitters
These can be found on ebay, and in some hobby shops
2 Infrared Detectors
These can be found on ebay, and in some hobby shops
2 10K Ohm Potentiometers
http://www.mouser.com/ProductDetail/Bourns/3306F-1-103/?qs=sGAEpiMZZMtC25l1F4XBU9QhtPcWQTANAkX0QUL%2f5Dw%3d
Optionals
RED LED There are a Red & Green LED built on board the MSP430G2 Board. This project shows them externally for
GREEN LED demonstration purposes.