LED Display and Control Board

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Project Overview

Nowadays, LED (Light Emitting Diode) display panels are widely used for advertising, as notice boards in hospital and police force. After the development of blue LED and the great improvement of the LED intensity, the demand of the large outdoor LED display is much higher. However the size of the control system is always large compare with the LED display panel. The size of the control circuit is than a great disadvantage for large LED display panel.

In this final year project, a LED display and control board, and a panel design software were implemented. The software with a user friendly interface is used for the user to design and output a picture to the LED display panel. The control circuit of LED panel is designed with smaller size. The display circuit is also designed as module such that several LED display boards can be combined to be a larger display panel. The PCB layout of the control circuit and the display circuit are designed by Protel99SE. And we also used MedWin to design and compile the program of the microcontroller. The panel design software is written by C++ with Microsoft Foundation Class (MFC).
The Whole System Block Diagram:

Panel Design Software:

User Input ➔ Output to LED panel ➔ Microcontroller receive and output data to LED display board ➔ Decoder manage the output to different LED board

The Block Diagram of the Software:

A New Design

Design Window ➔ OnConvert (Mapping) ➔ Preview Window

- Design Window
- Class Shape (Drawing tools)
- Class PixelMap (For output data Storage of whole design)
- Class LEDBoard (For data storage of 1 LED Board)
- Class FreeHand
- Class Circle
- Class Line
- Class Rect

* Blocks with dot outline are the classes/functions we have to create.
Blocks with line are the basic structure of the program
Block Diagram for the Control circuit:

Data are sent to memory for storage

Data get from memory and sent to decoder for display

IC (Decoder) used to control line scanning for the display

Data received from PC

Memory

Red Pixel

Green Pixel

Data are sent to memory for storage

Data get from memory and sent to decoder for display

Memory

Red Pixel

Green Pixel

Result:

Transmit to LED panel through serial communication