An LED Display and Control Board

Project Code: IMM2-01

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**Project Overview**

There are many types of displays exist nowadays, such as Light Crystal Display (LCD) and Projection-type. They are used mainly in the indoor facilities. However, from a lot of advertisers, there is an increasing demand for outdoor displays in today’s world. After the development of high brightness blue and green LEDs (Light Emitting Diode), LED open-air displays for the general public have been increasing. The LED matrix display has played a main role in the outdoor display panel market.

In this project, a stand-alone LED Display and Control Board, and a graphical user interface (GUI) was implemented. The GUI can be used to create a display content on the LED board. To implement this project, we designed a display circuit diagram and PCB layout using PowerLogic and PowerPCB, using GNU C to compile a program for the micro-controller and the program for the graphical user interface was written using Microsoft Foundation Classes.
**Project Flow**

- **GUI program**
  - Importing Pictures or Drawing → Color Mapping of the pictures → Encoder

**Control Circuit**
- **Red LED Driver**
- **Green LED Driver**

**Micro Controller**
- Decoder

**LED Display Panel**

**Data File**

**Belief Description**

**Structure of the GUI Program**

```plaintext
Microsoft Foundation Classes

COBJECT

CCmdTarget

CWnd

CDocTemplate

CDataDocument

CFrameWnd

CView

CSingleDocTemplate

The GUI Program

CLEDDisplayView

CLEDDisplayDoc

CLEDDisplayWnd

CElement

CPicture

CDataManager

CCircle

CRectangle

CLine

CCurve

CText
```

**Structure of the GUI Program**
Control Circuit

Row Control
Johnson Decade Counter (CMOS 4017)
Power Transistor (TIP 122)

Micro-Controller module

LED Display Panel

Column Control
TTL Buffer (74LS240)
Red Column Driver (T6A39)
Green Column Driver (T6A39)

Result

LED Display and Control Panel