A10-149

作品名稱　**轉吧!霓虹燈**
　　　　　that's turn! neon
隊伍名稱　**電動大樂隊 Electric Big Band**
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作品摘要

本文主要提出一種旋轉式LED顯示器設計及其進行旋轉顯示圖樣編輯所需之人機介面程式規劃。旋轉式LED顯示器之架構主要包括由直流伺服馬達驅動之旋轉式圓形底盤，底盤上層組設有電控電路板及LED的驅動介面電路及電源電路，圓形底盤可等間距組設有若干紅綠藍(RGB)之LED燈排，LED燈排可對稱組設於底盤之固定點呈錐形或柱形排列螺固。LED燈排依其所需長度組設有複數個高亮度RGB LED，藉由可脈寬調變(PWM)之定電流IC調變RGB LED的亮度。旋轉式底盤底端由多個絕緣之導電金屬環構成，藉由碳刷傳送所需之電力到上層之電路板。當馬達驅動底盤旋轉時，燈排呈角錐體或圓柱體高速旋轉，控制RGB LED三顏色的灰度值於不同位置的色彩變化，由於視覺暫留的作用，可達成豐富多樣的全彩文字或圖形顯示效果。而為了達成容易編輯旋轉式RGB LED顯示器的顯示畫面及色彩變化，本文並進一步開發有轉檔所需之人機介面程式，配合燈排電路及微控制器介面設計，可直接將所欲顯示的畫面轉換成對應之顯示樣本資料，因而可輕易的進行各種文字圖樣的顯示變化。經由實際測試的結果，本文以RGB LED各色階的顏色組合及直流伺服馬達的轉速控制，達成了全彩LED的豐富色彩顯示效果。

Abstract

This paper presents a rotating LED display design and display design editor of rotation required for the interface of the program plan. The structure of rotating LED display includes DC servo motor driven by a rotating circular chassis, the chassis with electronically controlled upper group and the LED driving circuit board interface circuit and power circuit, circular chassis with a number of groups can be spaced red, green and blue (RGB) of the LED light emission, LED light emission can be located on the chassis of the symmetry group of the fixed points were arranged in spiral cone-shaped or cylindrical solid. LED light emission according to the required length of the group with complex high-brightness RGB LED, can be pulse-width modulation by (PWM) IC modulation of the constant current RGB LED brightness. Rotating chassis at the bottom of the conductive metal by a number of insulated rings, through the brush to the upper transmission power required for the circuit board. When the motor-driven disk rotation, the light emission was pyramid or cylinder high-speed rotation, three-color RGB LED control of the gray value of the color changes in different locations, due to the role of persistence of vision, can achieve a variety of full-color text or graphic display. In order to reach easily edit the rotating display RGB LED display and color change, and further development of this paper are required for man-machine interface file conversion program, with light emission circuit and micro-controller interface design, wants and hopes can be directly shows the display screen into the corresponding sample data, which can easily display various text patterns changed. By actual test results, this paper RGB LED color combination of the various Levels and DC servo motor speed control, full-color LED to achieve a rich color display.