



- 作品名稱** LED 路燈控制系統
LED Street Lighting Control System
- 隊伍名稱** 玩味創意 Chew ideas
- 隊長** 楊家維 南台科技大學電機工程學系機電控制組
- 隊員** 陳志彬·陳琬慈 南台科技大學電機工程學系機電控制組
- 指導老師** 魏兆煌 南台科技大學電機工程學系

作品摘要

全球的照明用電約占總用電量的 19%，為了節能減碳，美、英、日及歐盟等各國宣布自 2014 年起全面禁用與禁生產白熾燈，因而 LED 照明產業正蓬勃發展，中國大陸已積極推動「十城萬盞」計畫，將在 21 個試點城市應用 100 萬盞 LED 照明；臺灣全台目前約有 160 萬盞路燈，若全改用 LED 路燈，每年將可減少用電約 13.4 億度用電量，比較現行的路燈，整體省電效益約達 57% 左右。

LED 路燈的優點不僅在於省電，長壽命、即時開與關、色彩與亮度調節等功能均為其特點，為達成此目的，LED 路燈必須具備一個控制電路，但由路燈之間距，此控制電路無法集中成一處，而必須分散到每盞燈上。因此，本專題開發了一套適用於長距離 LED 路燈的分散式控制方法，而且能適用於任何數量及任意增減 LED 路燈的系統。此系統能隨時刻、周遭照明及路況分別變更個別路燈之亮度與色彩，例如，於濃霧之路段由白光改便為黃光，或於危險路段以紅色標示，而個別 LED 路燈控制模組也可自行依周遭照明狀況調整燈光亮度，節約耗能消耗。

ABSTRACT

The present intelligent street lighting control system, consists of a central control unit, a serial interface and a serial data transmission network, and plurality of LED street light lamps; the central control unit generates a control signal transmitted through the serial interface to the serial data transmission network, on the network there are plurality of LED control modules, which receive the control signal to control the lighting effects of the street light lamps; various operating status of each street lamp can be feedback via the serial network to the central control unit. An emergency button can be installed on the street light lamp pole in this system, if necessary to change the lighting color, meanwhile its ID number will be send back to the central control unit, so the authorized manager in the control central can monitor each street light lamp in entire lighting system, improve the utility of street lightings, and enhance the road safety for people and vehicles.