

# 智能交通灯控制器设计

## Design of Intelligent Traffic Light Controller

### 摘 要

随着人口增长，交通工具的猛增，道路以及原有建筑的局限性，交通控制系统则根据需要也发展起来。对交通灯控制进行合理的安排和运用可以有效的缓解交通拥堵并且能够提高人们的出行效率，还能够减少交通事故，保证了我们的出行安全。

本次实验采用的智能交通灯控制系统是由 AT89C51 作为主要的控制器进行运作的，该类的智能交通灯控制系统主要是通过红外线接收器来接受控制信号，系统通过红外线接收器接受到了红外线信息以后进行作业，以此来实现常规车辆和特殊车辆（如 120 急救车，119 消防车等）的自动放行；将车辆检测电路采集的信息经过单片机进行处理，再由 LED 数码显示通行情况和倒计时；左拐右拐直行及行人的通行指示灯采用双色高亮度发光二极管，设计中还设有声音提示电路，便于盲人过马路。

智能交通灯控制系统的控制程序主要是由动态调节程序、主运作程序、系统显示程序、定时中断程序、车辆检测延时程序和特种车辆实时响应程序等组成的。本设计是软件及硬件结合的方式来实现，文中给出了具体硬件电路图及软件流程图及程序源码。

关键词：智能交通灯控制 AT89C51 车辆检测 车流量



## **Abstract**

With the growth of population, the rapid increase of means of transportation and the limitations of roads and original buildings, the traffic control system has also been developed according to the needs. Reasonable arrangement and use of traffic light control can effectively alleviate traffic congestion and improve people's travel efficiency, but also reduce traffic accidents and ensure our travel safety.

The intelligent traffic light control system with AT89C51 as the main controller is adopted in this design. The system receives the signal through the infrared receiver to realize the automatic release of the special vehicle (119120, etc.). The road condition signal is collected by the vehicle detection circuit, the traffic flow is adjusted dynamically after being processed by single chip microcomputer, and the LED digital tube is driven by 74HC244 to display the countdown. Turn left and right straight and pedestrians use two-color high-brightness LED, the design also has a sound prompt circuit to facilitate the blind to cross the road.

The control program of traffic light control system mainly includes the following parts: main program, traffic light time dynamic adjustment program, display program, timing interrupt program, vehicle detection delay program and special vehicle real-time response program and so on. This design is realized by the combination of software and hardware. The specific hardware circuit diagram, software flow chart and program source code are given in this paper.

Key words: Intelligent traffic light AT89C51 Vehicle detection Traffic flow

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