Smart Lighting System For Intelligent Home
CM1-04

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Introduction

In the past, the typical lighting system was mainly contained one subject, which is the lamp itself. However, in this few years, as the popularity of intelligent home is increasing rapidly, the technologies of house appliances become more advanced and mature.

Nowadays, lighting system is one of the most popular topics for intelligent appliances. It cannot only simplify our live but also make our live more colorful. Especially, the lighting system has been used for advertising, making visual effect of the furniture, or even used in the laser show in the Victoria harbor.

In this project, a smart lighting system is designed. A fully intelligent lighting system is no longer using only on-off button, instead, there can be meaningful signal transmission according to the user commands. This creates an environment that full of energy and excitement inside your home.

Aim and Objective

The project is intended to build a smart lighting system that consists of a microcontroller to be plugged into any wall socket. The controller will collect all input data from a source in order to control a lighting device on the receiving side.

Figure 1 - The overall system diagram
System and Circuit Schematics

![Diagram of system and circuit schematics](image)

Figure 2 - The internal structure of the system

## Working Principle

1. **Commands Input**
2. **PL3150 assigns operation commands**
3. **Amplify**
4. **Coupling Circuit**
5. **Transmit**
6. **External Memory**

- **Output (LED Display)**
- **PL3150 Data Conversion**
- **Coupling Circuit**
- **Receive**
The entitled system is separated into two parts; transceiver and receiver.

For the transmitting part, it includes Input, PL3150 Circuit, and Coupling Circuit Board. When pressing a button, the smart transceiver, PL3150, will detect the pressing and identify which button has been pressed. PL3150 will then assign operation commands. The signal will be generated according to the operation commands, and amplified by Discrete Interface Circuitry. After that, the signal will pass through a coupling circuit, which provides a stable communication environment for transmitting the signal, to power network.

The receiver will extract the signal from the power network, and then pass the signal into PL3150 through the coupling circuit. The smart transceiver will convert the signal back to the data format. Finally, the data will be shown on the display.