基于单片机的电子秤设计

摘　要

随着经济的发展，电子秤与我们日常生活紧密结合，为我们的生活提供了便利。在物品交易中，需要货物计量。因此秤是经济交易中不可或缺的工具。而电子秤与传统的机械秤相比，其结构比机械秤简单，体积更小，不受安装地点的限制，并且操作简单、易上手、称重速度快、结果精准、受外界条件干扰小，成为商人的重要帮手。另外，电子秤也被应用到很多领域，例如超市、工业制造、流水线作业。

本系统的设计由单片机、称重传感器、键盘输入和液晶显示、电源这五个部分组成。设计采用 STC89C52 芯片作为主控芯片，与时钟电路、复位电路相连，从应变式压力传感器传来的数据采集并处理，然后 HX711 芯片进行数据 A/D 转换，转换成实际重量后由 LCD12864 液晶显示屏实时显示物体的重量和价格，然后通过操作 4*4 矩阵键盘，进行输入单价，系统会根据单价和重量自动计算出总价。本设计的电子秤系统具有称重、超量程报警、去皮、计价等主要功能。其中超重功能为，如果称重的重量超过量程 10Kg 显示器会显示“超重”字样，并且板子上指示灯会亮起进行提示。电子秤的精度为 2g,最大称重范围为 10KG。本文主要介绍了电子秤的基本原理、硬件部分和软件部分的选择与构成，软件部分的设计，以及电子秤的功能。

关键词：单片机；应变式压力传感器；HX711 芯片

Abstract

With the development of economy, electronic scale is closely combined with our daily life, providing convenience for our life. In the trade of goods, the goods need to be measured. Therefore, the scale is an indispensable tool in economic transactions. And the electronic scale and the traditional mechanical scale, its structure is simpler than the mechanical scale, the volume is smaller, is not limited by the location of the installation, and the operation is simple, easy to get started, weighing speed is fast, accurate results, by the external conditions of the interference is small, become an important helper of businessmen. In addition, electronic scale is also used in many fields, such as supermarkets, industrial manufacturing, assembly line work.

The design of this system is composed of five parts: single chip microcomputer, w eighing sensor, keyboard input, liquid crystal display and power supply. Design USES S TC89C52 as main control chip, chip are connected to the clock circuit and reset circuit, coming from the strain type pressure sensor data acquisition and processing, and then H X711 chip A/D conversion, data conversion to the actual weight after the LCD12864 L CD real-time display weight and price of the object, then by manipulating the 4 * 4matri x keyboard, input the unit price, the system will automatically calculate the total price a ccording to the unit price and weight. The designed electronic scale system has weighin g,Overrange alarm, peeling, pricing and other main functions. The overweight function i s that if the weighing weight exceeds the range of 10Kg, the display will show the word "overweight", and the indicator light on the board will light up to prompt. The precision of electronic scale is 2g and the maximum weighing range is 10KG. This paper mainly i ntroduces the basic principle of electronic scale, the selection and composition of hardw are part and software part, the design of software part, and the function of electronic sca le.

Keywords: SCM; Strain type pressure sensor; HX711 chips