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行业与领域应用

基于Matlab GUI串口通信的实时温度监控系统设计

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摘要: 为提高温度监控系统中数据处理速度和软件开发效率,设计了基于Matlab图形用户界面(GUI)的温度实时监控系统。系统利用Matlab串口工具箱,以Modbus协议为通信协议,通过计算机控制岛电SRS13A型温控器,实现了在金属加热过程中对其表面温度值的实时监控。系统软件界面简洁,操作方便,内存占用小,通过参数配置可实现多种工作方式。实验测试结果表明,系统运行稳定,以1s的采样间隔和0.1℃的测量精度,快速准确地绘制了系统在不同参数配置下的温度响应曲线。

关键词: Matlab图形用户界面 Modbus协议 串口通信 温度测量 实时监控

Real-time temperature monitoring system design based on Matlab GUI serial communication

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Abstract: In order to improve the speed of data processing and the efficiency of software development, a temperature real-time monitoring system was devised based on Matlab Graphical User Interface (GUI). Serial port tool box in Matlab and Modbus communication protocol were used to link up SHIMADEN SRS13A thermostat to PC, and the real-time monitoring of the metal surface temperature in heating process was implemented. The interface of the system software was simple and the software had convenient operation with smaller memory footprint. Variety operating modes could be achieved by setting different parameters. The test results show that, the system runs rapidly and stably, and the temperature response curves with different parameter configuration settings were plotted promptly and accurately. The system's sampling interval was 1s and the temperature measurement accuracy was 0.1℃.

Keywords: Matlab Graphical User Interface (GUI) Modbus protocol serial communication temperature measurement real-time monitoring

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