

ABSTRACT

Home automation and security system is a system that integrates and controls home electrical appliances and generally consists of sensors, controller board, and actuators. A home automation and security system usually runs a single function, such as door locking system, smoke and fire alarm, or lights otomation only, so that another system is required for the other functions. In this research, an embedded system based controller board and extender modules are made. The controller board is made to be able to read any type of sensor with an adjustment first and turn on and off home electrical appliances, such as lights, air conditioners, TV, and others, automatically. The extender module is a standalone system, such as door locking system, security camera, etc., which can be connected to the controller board via a USB cable. When an extender module is connected to the controller board, the controller board will receive event logs of the extender module and forward it to the server for monitoring purpose. The controller board will be based on microcontroller supported by Real-Time Clock, Bluetooth module, Wi-Fi module, eight digital input channels, eight output channels, and four extender module channels. The controller board can be configured as needed, such as switching on lights for a certain clock range or turning on the lights when the light sensor detects dark condition. This research is implemented on a homestead model that has been prepared according to the test requirements. The controller board can be configured using desktop application via Bluetooth connection at maximum distance of ± 4.8 meters without obstacles. The controller board can be connected to a Wi-Fi network at maximum distance of ± 18 meters in order to send its event logs to the server for monitoring purpose. The results of this study indicate that the controller board can be configured with 100% accuracy and can send its event logs to the server with 100% data transmission accuracy.

Keywords: *embedded system, controller board, home automation and security system*