System construction:

The system is a smart home-based Bluetooth and consists of 2 Electronic control units (ECUs). The names and responsibilities of each ECU are summarized below:

1. Control ECU

- Take the input from Bluetooth.

-Send the received input to the actuator ECU via SPI

1. Actuator ECU

-Receive the data from Control ECU

-Interpret the received data in order to control 2 LEDs

The interface between the Bluetooth module and control ECU via UART communication protocol.

Control ECU (master) sends the received data from the Bluetooth to the actuator ECU via SPI communication protocol. The Control ECU (slave) receives the data and interprets to control on/off LED 0 in Port C pin2 and LED 1 in port C pin7.

If the input is “a” the LED 0 is on. If the input is “b” the LED 0 is off.

If the input is “c” the LED 1 is on. If the input is “d” the LED 1 is off.

LED 0 on/off

LED 1 on/off

SPI

Actuator ECU 2 (Slave)

(S

UART

Control ECU1 (Master)

(S

Bluetooth module

Flow chart

Read Bluetooth inputs

Send to actuator ECU

Receive commands

No

No

NO

Is data = a

Yes

LED 1 Off

LED 1 ON

Is data = d

LED 0 Off

LED 0 ON

Is data = b

Is data = c