Project Hardware Specification

Group #8
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Presentation Layout

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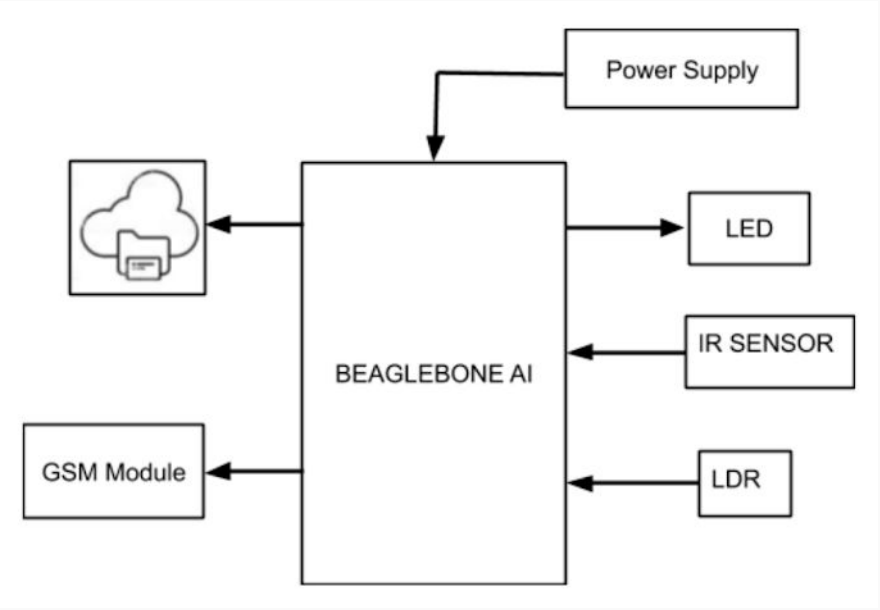
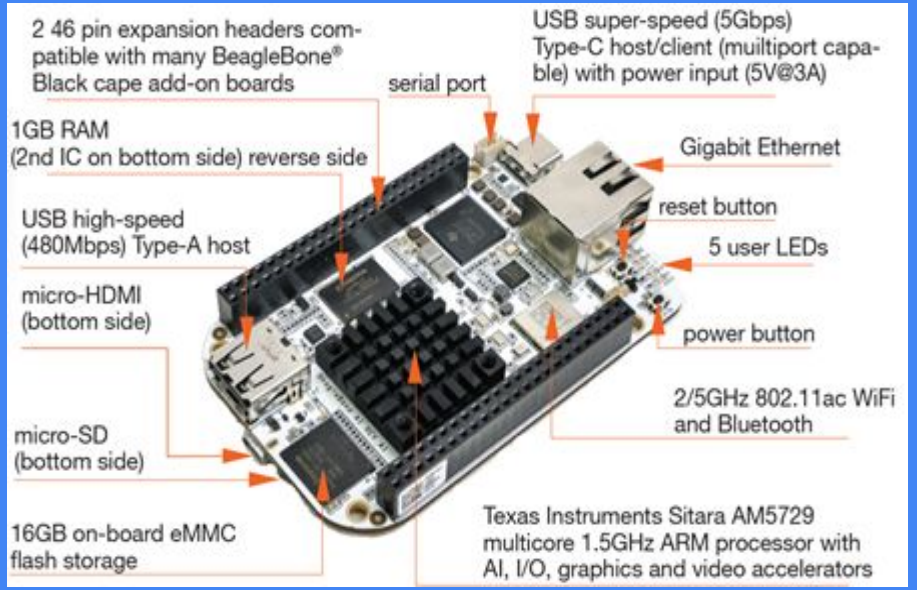
PROJECT OVERVIEW

- The project is used to improvise the conventional letter box system. It uses various peripherals and sensors for this purpose
- The letter box senses the number of letters and counts them along with each arrival it sends the message to the user and also when the letter is removed the count of this letter goes to zero along with a notification
- The information of the arrival time along with the date is stored in the cloud

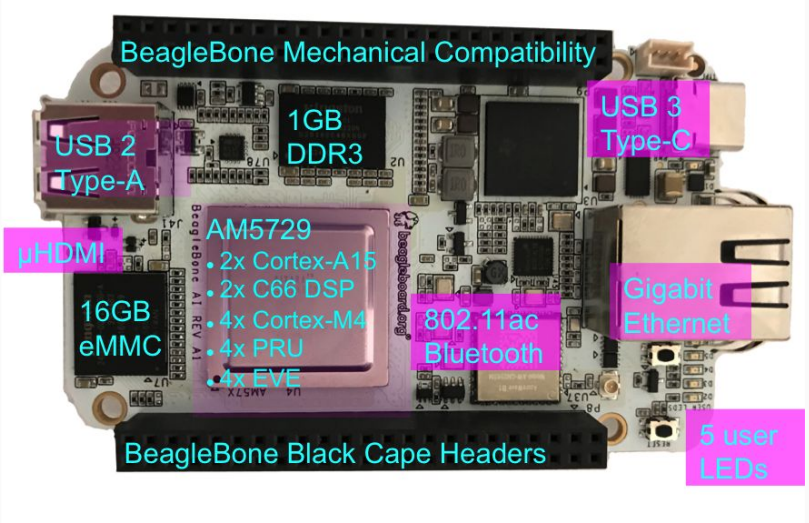


BEAGLEBONE AI



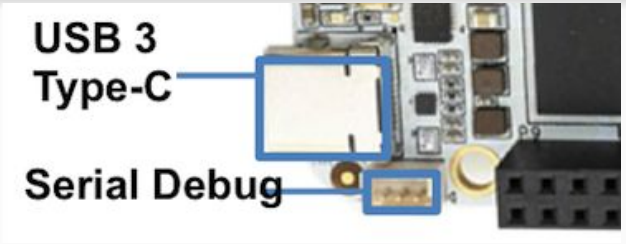
BB-AI (BEAGLEBONE ARTIFICIAL INTELLIGENCE)

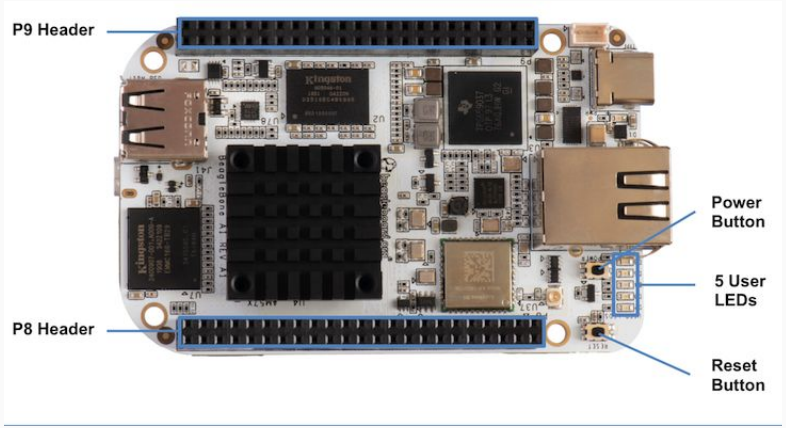
- Dual ARM Cortex-A15 processor which is much faster than existing BeagleBone Black
- Memory: 1 GB RAM and 16 GB on-board eMMC Flash
- BeagleBone® AI comes in a similar form-fact as BeagleBone® Black and compatible with many BeagleBone® Cape add-on boards make it easy to extend the functionality.
- Has in-built Wifi supporting 802.11ac via AzureWave AW-CM256SM supports dual band of 2.4 GHz and 5 GHz
- Type-C (host/ client- superspeed) and Type- A USB host



BB-AI (BEAGLEBONE ARTIFICIAL INTELLIGENCE)

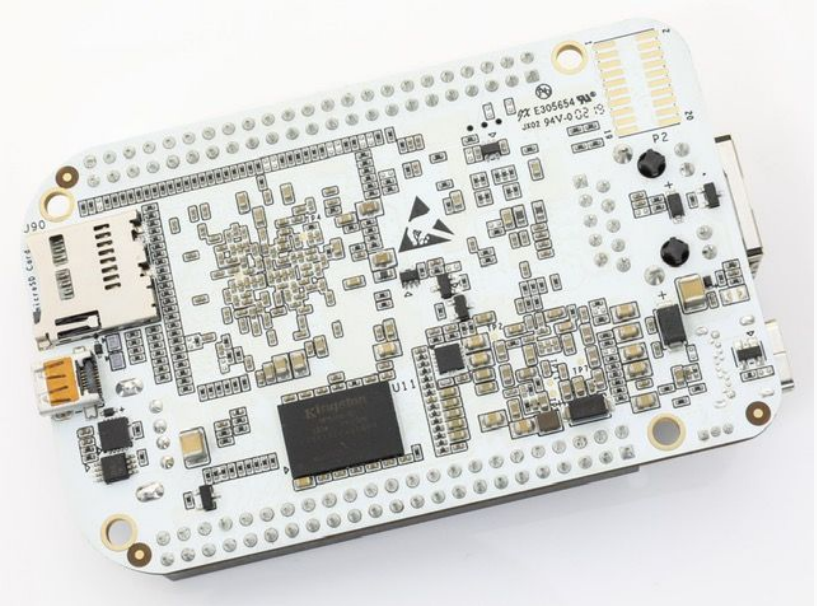
- 2 x 46 expansion header which includes 4+ UARTSs, 2 I2C, 2 SPI and lots of PRU and I/O pins
- 3- pin serial Debug
- Power by 5 V, 3A Adapter with working voltage of 3.3 V
- 5 User LEDs which are connected to the GPIO and indicate various functions like HeartBeat when Linux is Running, microSD Activity, CPU Activity, eMMC Activity, Wifi/Bluetooth Activity



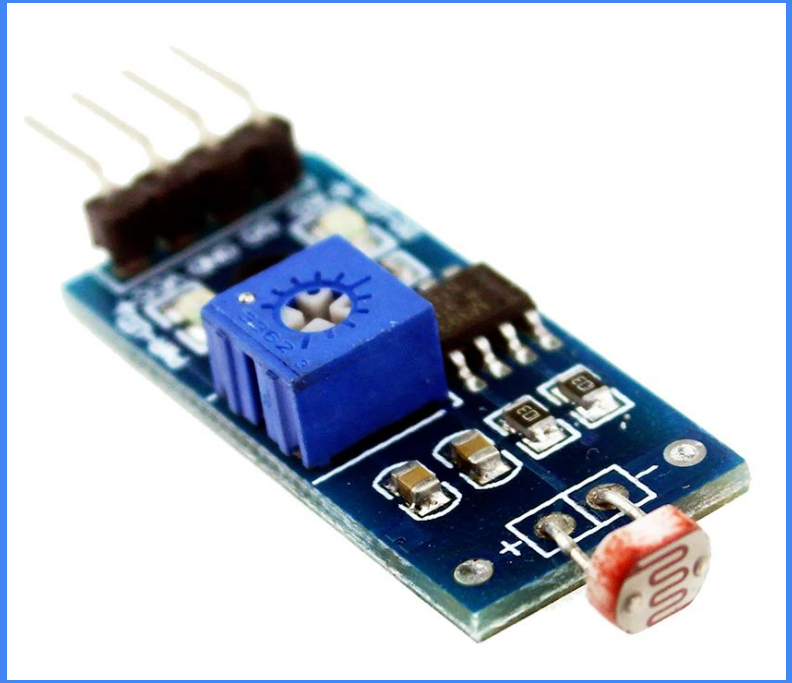


BB-AI (BEAGLEBONE ARTIFICIAL INTELLIGENCE)

- Consists of Pre-attached Heatsinks
- Supports Bluetooth with 1 antenna to support Transmit and Receive
- Bluetooth Version: 4.2. Supports data rate of 2Mbps and 3Mbps
- MicroSD Card slot along with support for HDMI
- The only drawback is that due to high processing speed the processor may become hot. It happens only when high computations are performed.
- This will function as the main heart of our project

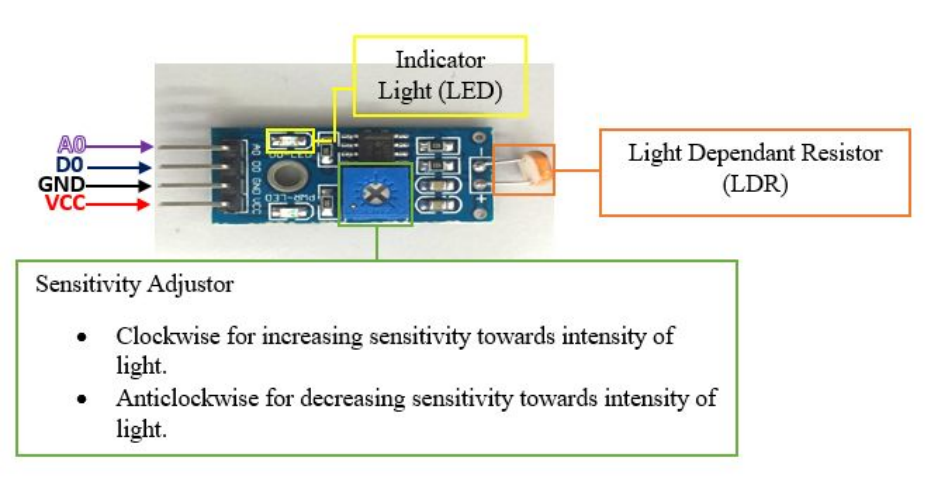


LDR (LIGHT DEPENDENT RESISTOR)



Light Dependent Resistor (LDR)

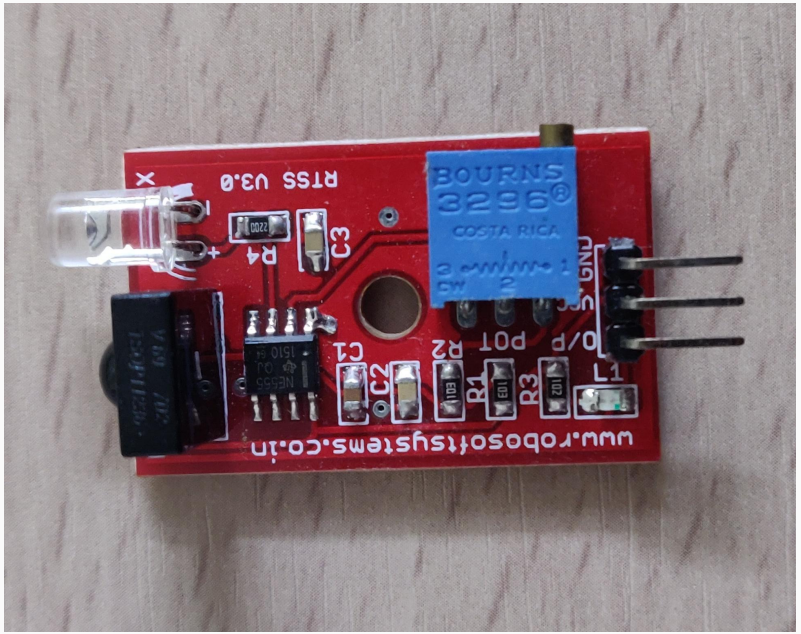
- Can be used to sense light
- Small, cheap and easily available
- Operating Voltage: 3.3 V to 5 V DC
- Operating Current: 15 mA
- Output: Digital (Adjustable trigger level from preset) and Analog (Based on light falling on the LDR)
- LM393 based design and works on the principle of photoconductivity
- It shall be connected to the main processing unit to detect the intensity of light and thus help in resetting the count for the letters. Used only when all the letters have been taken out from the box



IR (INFRARED) SENSOR

IR SENSOR

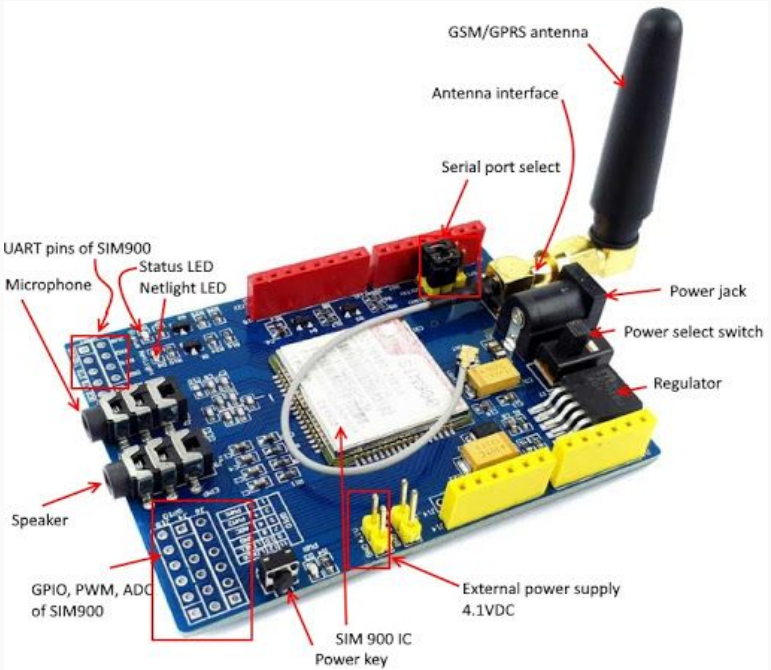
- Operating Voltage: 5V
- I/O pins are 5V and 3.3 V compliant
- Range: Upto 20 cm
- Adjustable sensing range through the Pot
- Digital Output with low power consumption
- This sensor will be used to check for the arrival in the letter box
- Alternative for this sensor would be TCRT5000 which uses LM393 based design



GSM MODULE SIM900 ARDUINO SHIELD

GSM MODULE SIM900 ARDUINO SHIELD

- Quad-Band 850/ 900/ 1800/ 1900 MHz would work on GSM networks in all countries around the world
- Supports RTC through the battery support for 3V CR 1220 at the back
- Supply Voltage ranging from 3.4 V to 4.5 V and Low Power Consumption
- This module is used to send SMS (Short Service Message) to the user when any letter arrives
- The SMS is sent via the AT Commands



GSM MODULE SIM900 IMAGES

FRONT VIEW

BACK VIEW

Other Accessories

- Power Supply: Type C adapter of rating 5V, 3A in order to power up the main processing unit i.e. BB-AI
- Jumper Wires: To make the necessary connection in the circuit
- Resistors: To connect the LED appropriately.
- Electronic and Soldering Kit: Soldering Iron, Multimeter, Soldering wire and desoldering pump
- LED: To indicate if the letter is present in the box if off then no letter is present in the box.

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