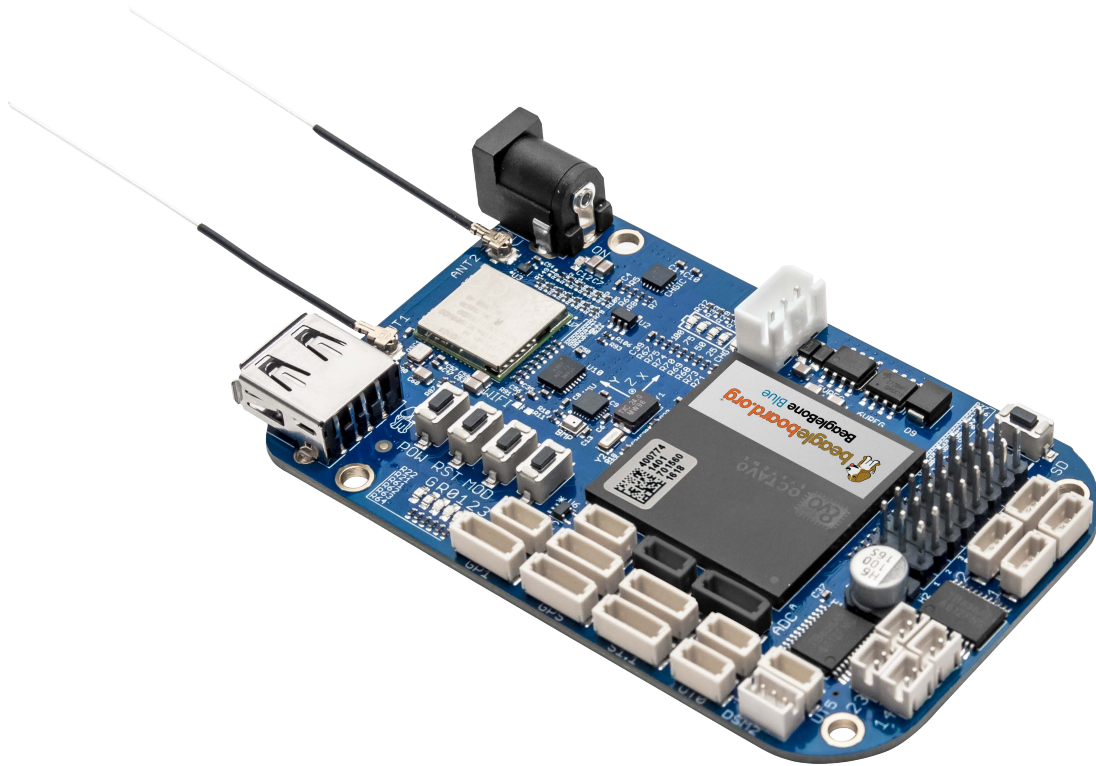




# beagleboard.org<sup>®</sup>



What is BeagleBone<sup>®</sup> Blue...

BeagleBone<sup>®</sup> Blue is the affordable and complete robotics controller built around the popular BeagleBone<sup>®</sup> open hardware computer. Linux-enabled, Blue is community-supported and fully open-source. High-performance, flexible networking capabilities are coupled with a real-time capable Linux system and a compelling set of peripherals for building mobile robots quickly and affordably. Utilizing the pre-configured WiFi access point, starting your code development is as simple as connecting a battery and opening your web browser.

Processor: Octavo Systems OSD3358 1GHz ARM<sup>®</sup> Cortex-A8

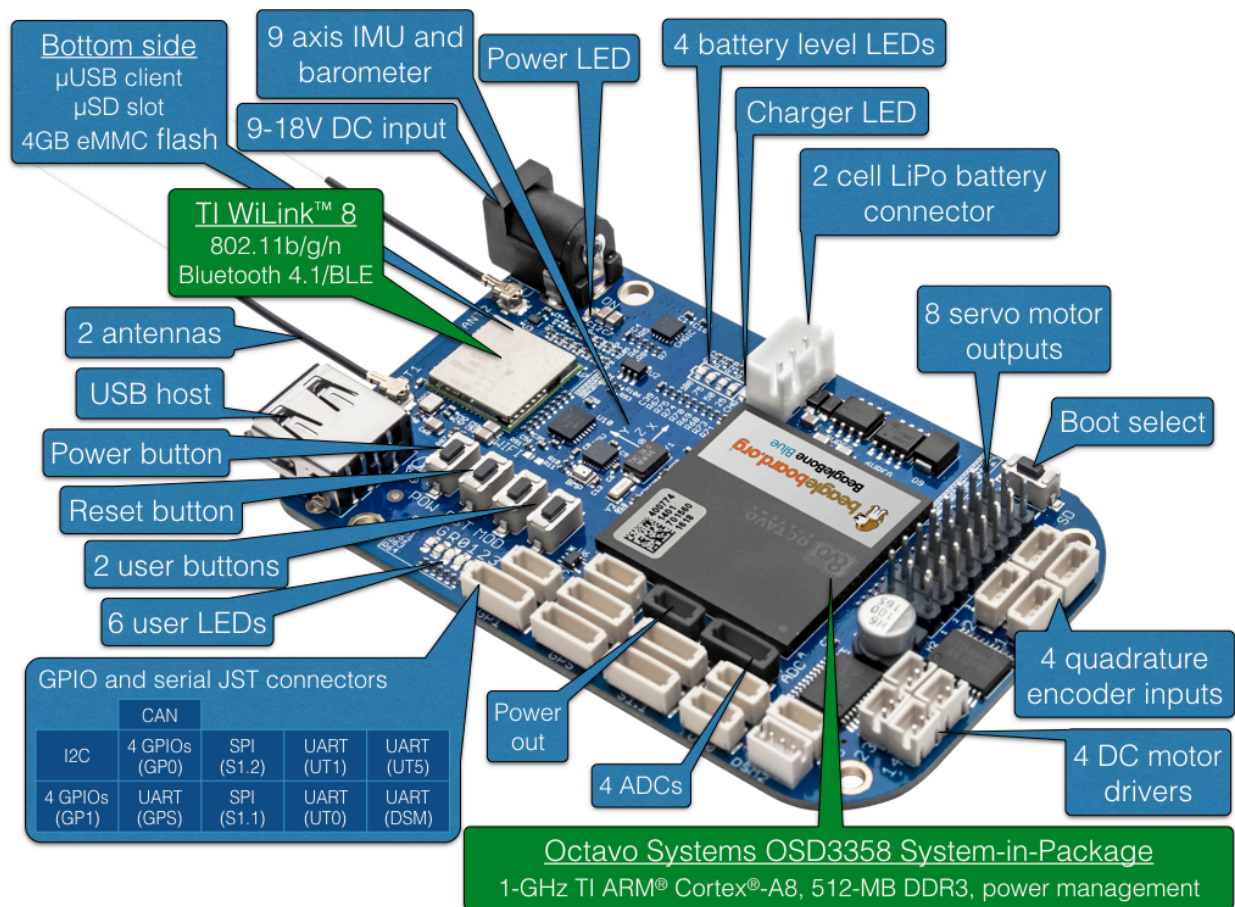
- 512MB DDR3 RAM
- 4GB 8-bit on-board flash storage
- 2×32-bit 200-MHz programmable real-time units (PRUs)
- On-board flash programmed with Linux distribution

Connectivity and sensors

- Battery: 2-cell LiPo support with balancing, 6-16V charger input
- Wireless: 802.11bgn, Bluetooth 4.1 and BLE
- Motor control: 8 6V servo out, 4 DC motor out, 4 quad enc in
- Sensors: 9 axis IMU, barometer
- Connectivity: HighSpeed USB 2.0 client and host
- Other easy connect interfaces: GPS, DSM2 radio, UARTs, SPI, I2C, analog, buttons, LEDs

Software Compatibility

- Debian, ROS, Ardupilot, ...
- Graphical programming, Cloud9 IDE on Node.js
- plus much more



## Specifications:

- a. Processor (Integrated in the OSD3358):
  - i. AM335x 1GHz ARM® Cortex-A8
  - ii. SGX530 graphics accelerator
  - iii. NEON floating-point accelerator
  - iv. 2x PRU 32-bit 200MHz microcontrollers
- b. Memory:
  - i. 512MB DDR3 800MHZ RAM (Integrated in the OSD3358)
  - ii. 4GB 8-bit eMMC on-board flash storage
  - iii. SD/MMC Connector for microSD
- c. Software Compatibility
  - i. Debian
  - ii. Ardupilot

- iii. ROS
- iv. Cloud9 IDE on Node.js w/ BoneScript library
- d. Connectivity
  - i. High speed USB 2.0 Client port: Access to USB0, Client mode via microUSB
  - ii. High speed USB 2.0 Host port: Access to USB1, Type A Socket, 500mA LS/FS/HS
  - iii. WiLink 1835 WiFi 802.11 b/g/n 2.4GHz. Supports the following modes
    - 1. 2x2 MIMO
    - 2. AP
    - 3. SmartConfig
    - 4. STA
    - 5. Wi-Fi Direct
    - 6. Mesh over Wi-Fi based on 802.11s
  - iv. WiLink 1835 Bluetooth 4.1 with BLE
  - v. Serial port:
    - 1. UART0, UART1, UART5 available via 4 pin JST-SH connectors
    - 2. UART2 available via 6 pin JST-SH connector (EM-506 GPS style connector)
    - 3. UART4 RX available via 3 pin DSM2 (JST-ZH) connector
  - vi. I2C1 available via 4 pin JST-SH connector
  - vii. SPI1 CS0 (S1.1) and SPI1 CS1 (S1.2) available via 6 pin JST-SH connectors
  - viii. CAN available via 4 pin JST-SH connector (includes TCAN1051 CAN transceiver)
  - ix. 8 GPIOs (GP0 and GP1) available via 6 pin JST-SH connectors
  - x. ADC inputs 0 to 3 available via 6 pin JST-SH connector
  - xi. 3.3VDC and 5VDC power output via 4 pin JST-SH connector
- e. Power management:
  - i. TPS65217C PMIC is used along with a separate LDO to provide power to the system (Integrated in the OSD3358)
  - ii. 2 cell (2S) LiPo battery charger (powered by 9 - 18VDC DC Jack)
  - iii. 6VDC 4A regulator to drive servo motor outputs
- f. Debug Support: JTAG test points
- g. Power Source
  - i. microUSB USB

- ii. 2 cell (2S) LiPo battery JST-XH connector
  - iii. 9 - 18VDC DC Jack
- h. User Input / Output
  - i. Power Button
  - ii. Reset Button
  - iii. Boot Button
  - iv. 2 user configurable buttons (MOD, PAU)
  - v. 11 user configurable LEDs (USR0-3, Red, Green, WIFI, Battery 0-3); Charger LED; Power LED
- i. Motor Control (requires power from either DC Jack or 2S battery):
  - i. 4 DC motor drivers
  - ii. 4 Quadrature encoder inputs
  - iii. 8 Servo motor outputs
- j. Sensors
  - i. 9 axis IMU
  - ii. Barometer

#### Recommended Accessories

- Chassis with geared DC motors: [Pololu Romi Chassis](#)
  - [Wheel encoders](#)
  - [Chassis - Black](#)
- Cable sub-assemblies:
  - [UART, I2C, CAN, Quadrature encoders, PWR - 4-wire JST-SH](#)
  - [SPI, GPIO, ADC - 6-wire JST-SH](#)
  - [Motors - 2-wire JST-ZH - wires, receptacle](#)
  - [DSM - 3-wire JST-ZH](#)
- Cables
  - microUSB -- standard
- Batteries
  - [2S1P LiPo with 3-wire JST-XH charge connection](#)
- Power supplies
  - [12V, 4A with 5.5mm/2.1mm center positive and power cord](#)
- Servo motors
  - [6V DC servo motor](#)
- GPS
  - [Adafruit Ultimate GPS breakout](#)
- Replacement antennas
  - [Antenna](#)
- USB cameras
  - Logitech C270
  - Logitech C920
- SPI TFT displays
  - [Adafruit 2.4" LCD breakout](#)