# BeagleBone Black WiFi

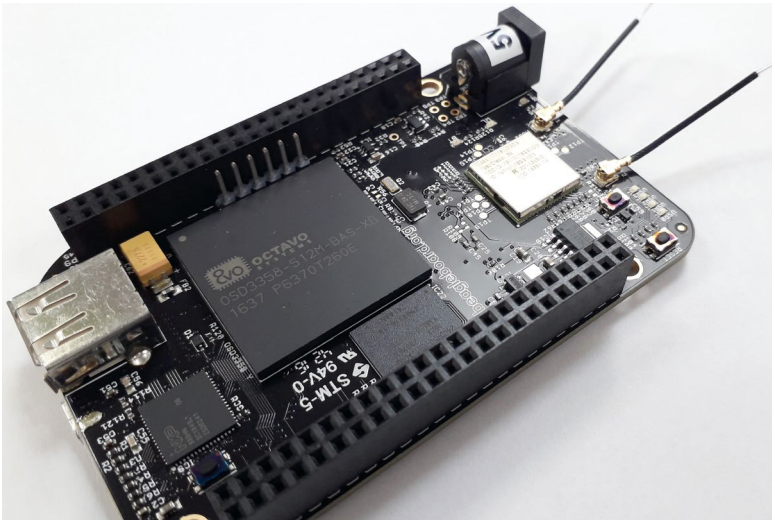
The BeagleBone Black Wireless SBC isn't Raspberry Pi-compatible, but does that matter? **Mike Bedford** takes a look.

**SPECS**

**OS:** Debian
**CPU:** Arm Cortex A8, 1GHz, 1-core, plus 2x 32-bit controllers
**GPU:** SGS530
**MEM:** 512MB
**HDD:** 4GB onboard, microSD slot
**Display:** Micro-HDMI, parallel LCD (on GPIO headers)
**USB:** 1x 2.0 host (micro) host, 1x 2.0 client (micro)
**GPIO:** 2x 46-pin headers
**Comms:** Wi-Fi (802.11 b/g/n – 2.4GHz), Bluetooth 4.1
**Size:** 86mm x 54mm

The BeagleBone Black Wireless might not claim compatibility with Raspberry Pi boards, but this SBC is one of many products catering for the massive interest in bare-bones computing. Our first experience with it was favourable. Unlike many SBCs, the BBB Wireless has onboard flash memory with Debian pre-installed, which meant that we were up and running for the first time much more quickly than with most similar boards. Also, of course, it means you don't have to get hold of an SD card.

We do have one niggle regarding the installation, though: the micro-USB port and the micro-HDMI connector are very close together on opposite sides of the board. If you use a moulded micro-HMDI to HDMI converter, therefore, it's very tight and you risk mechanically stressing soldered joints between these connectors and the board.



The BBB Wireless has excellent capabilities, despite extremely poor general performance.

Turning to the other aspects of the specification, however, we can't help but point out the obvious drawbacks. A single-core, 32-bit CPU clocked at 1GHz together with 512 MB RAM looks positively ancient – indeed it's not a lot better than the very first Raspberry Pi. We knew that performance would surely suffer, and our initial tests confirmed that. Despite the claim that Debian will boot in 10 seconds, the best we could achieve was a massive one minute and 15 seconds.

Since you're only going to be turning it on fairly infrequently, a CPU-intensive benchmark test is more revealing. We used Sysbench, and to say that the result was disappointing would be an understatement. Calculating prime numbers up to 20,000 took 909 seconds, which is about 10 times longer than a Raspberry Pi 3B+ and about 14 times longer than the Model 4.

## Interfacing

Looking at basic interfacing, things don't get much better. If we exclude the client USB port, that enables it to be used from a separate PC or for supplying power if you don't use the alternative power jack, there's only one USB port. This means you'll have to use a hub to connect both a keyboard and mouse, unless you have a keyboard with built-in hub. It's also missing an Ethernet port and a camera port.

From what we've seen so far, it's fair to say that you're not going to buy the BBB Wireless if you want a general-purpose SBC, say as a tool for learning or teaching coding, let alone as a desktop replacement PC. However, before dismissing it out of hand, we should point out that the manufacturers have referred to it as a board for IoT applications. So perhaps it fares rather better if we look at it as a product for embedded applications.

First, there's power usage – or lack of it. If we exclude Arduino boards that don't run an operating system, BeagleBone products are generally acknowledged as among the least power-hungry, which is very important for battery-powered applications.

Next up is the two expansion headers which, between them, have 92 pins compared to the RPi's 40. Included here are 65 GPIOs, eight PWM outputs, seven analogue inputs, five serial ports, three I2C busses, four timers and more. While many users will never need all this, for heavy-duty embedded applications it seems likely you're never going to run out of I/O.

We should also point out that third party capes – that's the equivalent of RPi HATS – are widely available. Most importantly, though, all this I/O isn't driven by the main processor, but by a couple of 32-bit microcontrollers, for improved response in critical real-time applications. LXF

**VERDICT**

**RESELLER:** Farnell
**WEB:** https://uk.farnell.com
**PRICE:** £67.31

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| **FEATURES** | **8/10** | **EASE OF USE** | **8/10** |
| **PERFORMANCE** | **4/10** | **VALUE** | **7/10** |

Worth considering, but really only for embedded applications such as IoT where it excels, at a not inconsiderable price.

**» Rating 7/10**