EnergyBench™ FAQ

Q: Although EnergyBench runs on top of/in conjunction with the other EEMBC benchmarks, is it possible for me to adopt my own application code to this methodology?

The EnergyBench methodology is specifically aimed at the EEMBC benchmarks. If you wish to use the same methodology to run your own code, the easiest way is to create a single reentrant entry point. You can then easily integrate your code into the EEMBC test harness, replacing one of the existing benchmarks or adding a new benchmark in any of the suites.

Q: Has EEMBC considered non-intrusive current measurement for EnergyBench?

The methodology defined by EEMBC uses standard probes because of their lower relative cost. The cost of a single current measurement probe (such as the Tektronix TCP312) is more than $1000, while the default probes in the specification cost less than $15 each. However, non-intrusive current measurement probes may be used to get higher accuracy. The specified connection box for EnergyBench uses the BNC form factor, so current measurement probes are easily substituted.

Q: If I’m running Linux, how can I set up the trigger for my system? Can I use a UART?

If you’re running Linux, the assembly code needed to raise an interrupt requires writing a device driver. The default implementation in EnergyBench uses the UART (serial ttyS0). The specific method you use depends on whether you are using the EEMBC Test Harness (th) or EEMBC Test Harness Lite (th_lite) supervisory software. In th, a character is written to the UART. The DAQ identifies the higher voltage level and starts sampling. In th_lite, a pin on the UART is held high throughout the benchmark execution. You may need to modify the start delay until you get the start of the sampling aligned with the start of the benchmark. A bit of experimentation should be sufficient to produce the desired result. If you can control a general I/O directly with an assembly instruction, however, it would be easier to determine the timing exactly rather than experimentally. Also keep in mind that when using a UART, you will want to set the maximum iterations to analyze on the analyzer module, since the signal to stop sampling will occur a little after the benchmark has ended.

Q: Can you measure standby current/power using EnergyBench and the National Instruments hardware?

There is nothing that prevents EnergyBench and the NI hardware from measuring standby current. It will be necessary to perform this outside of the EEMBC benchmark control, by putting the devices into the standby mode of operation.

Q: Can you measure the energy consumption of a board using EnergyBench, or does it measure only CPU power?

It is entirely possible to measure the energy of the board using EnergyBench; the only difference is where the measuring points are established. Bear in mind that this may not produce realistic results unless you can control (i.e. by turning off) miscellaneous circuitry on the board.

Q: Does EnergyBench measure the power consumed by the OS?

EEMBC performance benchmarks do not exercise the OS, with the possible exception of page faults in some cases. But any power consumed by the CPU in the course of issuing instructions related to the OS will be measured and reported while EnergyBench is running. Future EEMBC benchmarks, such as the upcoming multicore benchmarks and AutoBench Version 2.0, require some level of OS functionality and therefore the OS will have a greater impact on the power consumption measured by EnergyBench.