

FAQ

Question not answered here? Send an email to support@ee-quipment.com

ee-203 Real-Time Current Monitor with USB

Q: How often should I run self-calibration?

A: When absolute accuracy is important, calibrate the unit at the supply voltage that will be used during measurement immediately before starting the measurement. The worst-case accuracy is specified in the ee203 Product Overview Document.

Q: Can I float the supply to the RTCM to measure current at higher voltages?

A: The power supply to the RTCM is provided by the USB port, which is connected to chassis ground through the USB host (i.e. your computer). You can float this supply by connecting to a laptop running off a battery, or a USB charger that is battery powered. Use caution connecting the ground terminal to a scope as it is most likely returned to chassis ground. This type of floating configuration has not been tested and caution is advised as the USB host and/or the RTCM may be damaged.

ee-201 Real-Time Current Monitor

Q: What is the relationship between the SCOPE output voltage and the measured current?

A: The SCOPE voltage is the negative of the LOG₁₀ of the measured current. For example, when Vscope = 3, the current is 10⁻³ = 1 mA.

$$\begin{aligned}V_{\text{scope}} &= -\text{LOG}_{10}(i) \\ i &= 10^{-V_{\text{scope}}}\end{aligned}$$

Q: Why do transitions to low power states sometimes appear to take a very long time?

A: The internal log amp has very high gain at low currents which reduces its bandwidth, making the response time slower. The output is also noisier at low current inputs due to the high gain of the amplifier.

Q: How can I measure current with more accuracy?

A: Use the Current Monitor to view overall behavior. For critical power measurements, put the DUT into a static state and measure using more accurate (expensive) equipment.

Q: Why should I invert the scope trace?

A: The Current Monitor output is 0 → 6V. However, the scope display will be more intuitive if it shows the output as ranging between 0 → -6V (up on the scope is higher current).

Q: Can I put the Current Monitor in the ground return rather than the supply?

A: No, the internal circuitry operates from a single positive supply and will not operate properly when the input is near ground.

Q: At low currents why is the display noisy?

A: The internal log amp has very high gain at low currents. This amplifies any noise in the system and also reduces the bandwidth, making the response time slower.

Q: If I measure the voltage on the DUT pin with nothing connected to the DUT and SUPPLY pins, why do I see a voltage of as much as 8V?

A: If there is no load on either the SUPPLY or the DUT terminals you may see a voltage from an internal calibration circuit that offsets small (uV) errors in the instrument at low currents. This circuit can only supply up to 5 uA of current, so it will not damage any load connected to the DUT terminal.

ee-1201 Demo Board

Q: What is the useable voltage range?

A: Current Sink: 1.8 – 5.5V, although the 100 mA sink starts to lose accuracy below 2.2V.

MPU: 1.8 - 3.6V. **DO NOT enable the MPU if the supplied voltage is greater than 3.6V.**

Q. How accurate is the current sink?

A. Within +/-1 uA at 10 uA, and within 2% at all other ranges.

Q. Why does the demo board sometimes power up drawing 20-30 mA and the current sinks don't work?

A. There is a voltage reference on the board that sometimes powers up in an illegal state, drawing current and supplying an improper voltage reference. Remove and re-apply power to the board with all jumpers removed and the condition should resolve itself.

Q. During STOP3 MODE, the quick start guide shows that the voltage should be -6.1V, why am I seeing around -9V?

A. Depending upon process, voltage and temperature, the current draw in STOP3 MODE can be as low as 0.4 uV. The RTCM cannot reliably measure less than 1 uA and the output when the current is less than that is undefined and will tend toward the internal supply voltage of 9V.