EDU-LAB Digital Class Joulemeter / Wattmeter

Product Code 211-001

Thank you for your purchase of this digital joulemeter / Wattmeter. Although this joulemeter / Wattmeter is a complex and delicate instrument, its ruggedness will allow many years of use if proper operating techniques are developed.

Please read the following instructions carefully and always keep this manual within easy reach.

Features:

The class joulemeter / Wattmeter is light and compact , it is designed for class demonstration and as well as for student use. it is housed in a rigid aluminum casing measures approximately 208 X 155 X115 mm W X H X D   . The unit can measure energy taken up by a load, either by AC power or DC power, from 1J to 999,999J , 1mJ to 999,999mJ and can also measure power level of 200mW and 200W

One pair of 4 mm socket is also provided to indicate the instantaneous power. Depending on mW / mJ
Or W / J range , 1V full scale deflection represents 100mW or 100W respectively.

Technical Specification:
- Design: single chip microprocessor with dedicated precision analog multiplier for power measurement.
- Input Voltage: 0 to 15V A.C., (0 to 21V D.C.), absolute maximum 35V DC, 24V A.C.
- Maximum current: 10A   A.C. / D.C
- Input Frequency: 0 to 500Hz Maximum
- Accuracy: 5%, typically better than 3% at full scale.
- Energy / Power Indications : 6 digits
- Built in timing function, start button starts timer and Joulemeter together, and at the same time, starts powering the load, the stop button stop timer and Joulemeter and disconnect the power for the load
- Power Supply: 220V-240V a.c. 50/60Hz

Protections :

The primary power transformer is protected by a 0.315mA slow low fuse   (T315mAL).

The mW / mJ ranges are current limited to 148mA with 141 ohm resistor. (Load at short circuit condition with input power of 21 d.c. or 21V rms), therefore, observe voltage drop across protection resistors when using higher load currents at mW/mJ range.

Also observe the possibilities of damaging the load when switching between range; when an input voltage is applied to the load at mJ/mW range, there is a substantial voltage drop across the current limit   resistors (141 ohm). When the range is then changed to J/W, there is no current limit resistor on these range and the load current is thus increased and there is a possibility of damaging the load.

For W / J ranges, the absolute maximum current is 10A, and we strongly recommend uses of power pack with electronic trip, for example, EDU-LAB 605-003 Bench power supply.

For most battery operation, the short circuit current will be less than 6A except for rechargeable batteries and alkaline batteries. Therefore, extra care must be taken when using those batteries as sources for the load to avoid damage to the machine.

Operation Instructions:

* Power up the unit
* Switch on the unit with the on/off switch, wait for few second for the unit to do self-calibration.
* When the display shows zero reading, the unit is now ready for use. Note that there may be
   small fluctuation of reading, about 0.5, this is 0.5% of the full scale , and this is normal
* Connect a load to the pair of load socket
* Feed the pair of input power sockets with suitable voltage for the load

1) Toggle the mode button for the require function, depending on the load, suitably chose the mJ /mW or J/W range
2) For power measurements, the digital readout would be the reading in W or mW, depending on the mode chosen
3) For energy measurement, press the start button and this will allow the input power to be transfer to the load, at the same time, energy measurement is made and display on the unit. You can press the time button at any time to see the time elapsed since the energy start transfers; this will not interrupt the operation of the joulemeter.
   To stop the energy measurement, press stop, and the energy transfer stops and the reading is thus freezed

   To make a timed measurement, you press the time button to indicate the elapsed, and when time is reached, press the stop button with another finger.

4) For another new measurement, press the reset button and repeat the above three steps