Joule-Thief™ EHD Modules Important Notice

AdaptivEnergy LLC (AE) provides enclosed product(s) under the following conditions:,

This prototype module is intended for use for **Engineering Development, Demonstration, or Evaluation Purposes Only** and is not considered by AE to be a finished end product fit for general consumer use. Persons handling the product(s) must have electronics knowledge and observe good engineering practices. As such, the goods being provided are not intended to be complete in terms of required design, marketing, and/or manufacturing related protective considerations, including product safety and environmental measures typically found in end products that incorporate such semiconductor components or circuit boards. This evaluation kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and therefore may not meet the technical requirements of these directives or other related directives.

The user assumes all responsibility and liability for proper and safe handling of goods. Furthermore, the user indemnifies AE from all claims arising from the handling or use of the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electro-static discharge.

EXCEPT TO THE EXTENT OF THE IMDEMNITY SET FORTH ABOVE, NO PARTY SHALL BE LIABLE TO ANY OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

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AE assumes **no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein.**

Please read the User's Guide and, specifically, the Warnings and Restrictions notice in the User's Guide prior to handling the product. This notice contains important safety information about temperatures and voltages.

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FCC Warning- This evaluation prototype module is intended for use for **Engineering Development, Demonstration, or Evaluation Purposes Only** and is not considered by AE to be a finished product fit for general consumer use. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment in other environments may cause interference with radio communications, in which case the user at his or her own expense will be required to take whatever measures may be required to correct this interference.

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Joule-Thief™

60 Hz and 120 Hz EHD Modules

(battery version)

Quick Start and Operation Guide

PT102976 (60 Hz) & PT103018 (120 Hz)

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Operating Instructions

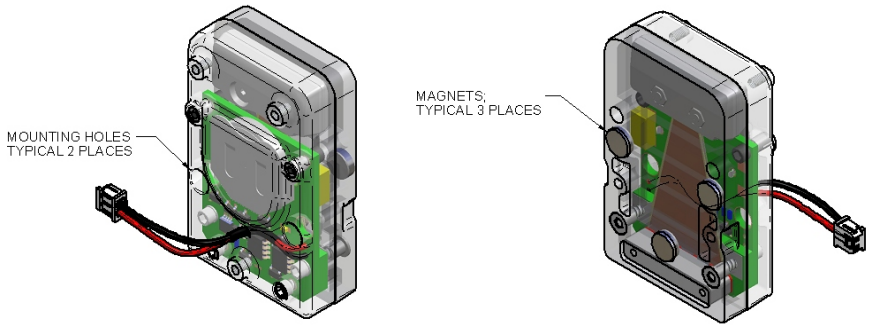
The device is designed to operate in resonance with a 60 Hz or 120 Hz input at 0.1 g_{rms}. A higher (or lower) input frequency will result in decreased power output from the harvester. Furthermore, a higher (or lower) input amplitude can result in a shift in the device's resonant frequency which will also limit the power output.

1. Attach the EHD module to a shaker table or other suitable source of vibration. This can be accomplished using one of the following methods. The mounting locations for both methods are depicted in the figure below.

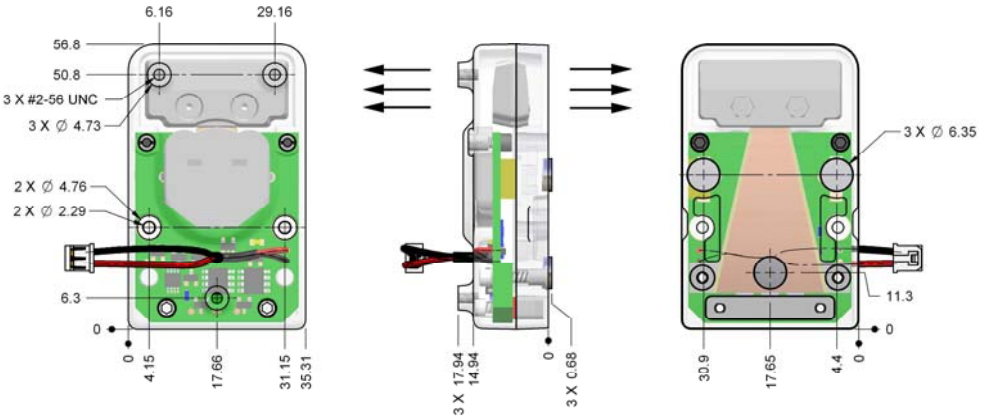
a) Two #2-56 fasteners through the unused holes in the central edges of the device. The fasteners are not provided with the module.

b) Attach to a magnetic surface using the three provided magnets mounted in the locations indicated in the figure below. The user must ensure that the vibrating surface is sufficiently magnetic for a rigid attachment.

Do not drill holes in the module.

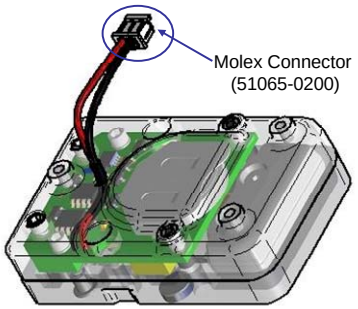


Vibration Direction
Indicated by the Arrows



2. The EHD module should be rigidly attached to the vibration source to maximize power transfer. This may require inserting a rigid "spacer" between the energy harvesting module and the source of vibration to attain the desired rigidity. The vibration input should be perpendicular to the base of the housing to maximize the power output from the device. The orientation is indicated in the figure above.

3. The two leads with the connector protruding from the energy harvesting module is the output from the EHD-enabled Li-ion coin cell battery. The connecter at the end of the wire leads is a Molex female connecter, part number 51065-0200. The mating connector for this part is Molex 53253-0270. The red wire is positive, and the black wire is negative. The normal output of the module is 3.15-4.1 V.



Mating connectors

1. MOLEX 53253-0270
2. MOLEX 53254-0270
   (Right angle)

4. Excite the device with either a shaker table or other suitable source of vibration.

5. Upon excitation, the EHD module will begin to charge the Li-ion battery and continue to do so as long as the energy harvesting module is subjected to a vibration input. The Li-ion battery has sufficient energy to temporarily serve as a power source when the module is not subjected to any vibration. If the output of the module exceeds the charging capacity, the battery voltage will drop until 3.15 V is reached at which point the module will turn off. This feature protects the battery from being over-discharged. The battery has a 40 mAh capacity.

CAUTION:

1. The EHD module should never be subjected to extreme vibration, sustained impact, or significant off-axis vibrations.
2. The acceleration input should never exceed levels that result in the end masses striking the inner housing.