OVERVIEW

The new Harvestor-III™ third-generation power module line provides perpetual electric power with best-in-class vibration energy harvesting (VEH) combined with ultra-efficient power management circuitry in compact, lightweight and durable enclosures.

ACI’s proprietary and uniquely-flexible piezo-fiber composites (PFCs) enable breakthrough performance in vibration energy harvesting - delivering useful electrical power for sensors, wireless networks and low power circuits.

When subjected to vibration from a wide range of sources (transportation, aviation, industrial, infrastructure), the Harvestor-III™ power module uses the piezo effect to capture the vibration energy and convert it into electric energy, regulate it, and store it for useful DC voltage output.

APPLICATIONS

Applications for the Harvestor-III Power modules often include perpetual power for wireless sensors, monitoring devices, preventive maintenance, and a range of milliwatt-powered electronic circuits and devices. In continuous or intermittent vibratory environments, the Harvestor provides an alternative to wired power and can also be used to replace or augment battery power to extend maintenance-free system life.

- Embedded Sensor Power Supply
- Wireless Transmitter Node Power Supply
- Condition Based Monitoring
- Battery Replacement
- Hybrid Energy Harvesting-Battery augmentation systems

PRODUCT LINE FEATURES & BENEFITS

- Perpetual power supply from ambient vibration: cost-effective and convenient.
- Energy harvesting, power conditioning, power storage, and regulated DC output in one convenient, mountable enclosure.
- Range of resonant frequencies available for easy integration and system design
- Broad frequency response around resonance for optimum in-situ performance
- Excellent high and low frequency VEH performance
- Proprietary piezoelectric fiber composite bimorph (PFCB) transducers convert ambient mechanical vibrations into electrical power
- Regulated 3V and 3.3V (DC) output
- 8.0V electronic protection clamp
- Ready for use as configured. Customization also available for your application.

MARKETS SERVED

- Industrial Sensing
- Transportation
  - Auto, Rail, Aviation
- Infrastructure Monitoring
- Aerospace
- Government
  - Military, Homeland Security
RANGE OF STANDARD MODELS: OPTIMIZED PERFORMANCE

Model H30
The Harvestor-III Model H30 is optimized for low frequency (30 Hz) ambient vibration environments not uncommon in many industrial mechanical equipment and infrastructure settings.

Models H60, H120 and H220
The Harvestor-III Models H60, H120 and H220 are optimized for vibration environments exhibiting these frequencies of vibration often found emanating from 60 Hz electric motors, engines, industrial and transportation systems and other higher frequency vibration environments.

HARVESTER-III™ TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model No.</th>
<th>H30</th>
<th>H60</th>
<th>H120</th>
<th>H220</th>
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</thead>
<tbody>
<tr>
<td>Center Frequency (Hz)</td>
<td>30</td>
<td>60</td>
<td>120</td>
<td>220</td>
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<tr>
<td>Voltage Out (V)* DC Power Jack</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
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<tr>
<td>Standard Storage Capacity (mF)**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Standard Dimensions (mm)</td>
<td>L 165 W 35 H 40</td>
<td>L 125.3 W 50 H 22.5</td>
<td>L 125.3 W 50 H 22.5</td>
<td>L 110.2 W 56 H 23.5</td>
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</tbody>
</table>

* Optional 3.3V configurable  ** Configurable

HARVESTER-III™ POWER MODULES

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>H30</td>
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<tr>
<td>H60</td>
<td>FIB-H60</td>
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<td>H120</td>
<td>FIB-H120</td>
</tr>
<tr>
<td>H220</td>
<td>FIB-H220</td>
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</tbody>
</table>

ENERGY HARVESTING DEPLOYMENT EXAMPLE

Vibration Source (e.g. equipment, motor, structure) → Power Module Energy Harvesting & Storage (Sensor) → Wireless Transmission → Capacitor

POWER HARVESTING/CHARGING PERFORMANCE

![Graph showing Charged Voltage (VDC) over Time (s) for different models: H30, H60, H120, H220. The graph includes capacitance: 1 mF and acceleration: 3 g.]

LATEST GENERATION ENERGY MANAGEMENT CIRCUIT: CHARGING & REGULATED VOLTAGE OUTPUT

![Graph showing Voltage (V) over Time (s) with Capacitor and Output lines.]

THE HARVESTOR-III™ POWER MODULE