The HM Digital Hybrid® UHF plug-on transmitter features a DSP-based design that allows the transmitter to operate in its native Digital Hybrid Wireless® mode, Lectrosonics 200 Series, 100 Series, IFB product groups, plus three modes for compatibility with analog receivers from other manufacturers. A unique multi-voltage phantom power feature allows the transmitter to be used with virtually any microphone, including high-current condenser types, expanding its usefulness in high-end applications such as motion picture production.

The transmitter provides up to 1024 frequencies selected with the membrane switch keypad. The input amplifier uses an ultra low noise op-amp for quiet operation. It is gain controlled with a wide range dual envelope limiter, providing over 30 dB of headroom above full modulation. A 24-bit A-D converter digitizes the audio, then filters supersonic noise above 21 kHz. The resulting signal is encoded with a proprietary algorithm to produce an analog data signal for RF transmission. The underlying RF link is an optimized FM system with +/-75 kHz wide deviation for a high signal to noise ratio.

The antenna is formed between the lower housing of the transmitter and the attached system. It functions as a dipole radiator when attached to a hand-held microphone and somewhat like a ground plane antenna when connected into a mixer. The conical shaped collar on the input coupler is made of DuPont™ Delrin® to improve the ERP of the antenna in the uppermost frequency blocks.

**DSP-Based Pilot Tone & Compatibility**

The DSP eliminates the need for fragile crystals, plus it allows a different pilot tone for each of the 256 frequencies in the tuning range of a system's frequency block. Individual pilot tones virtually eliminate squelch problems in multichannel systems where a pilot tone signal can appear in the wrong receiver via intermodulation products. A circulator/isolator in the output stage further ensures against intermodulation interference.

**Outstanding Audio Performance**

The audio performance of the overall hybrid system is depicted in the graph below. Distortion in the overall system is extremely low over the entire audio bandwidth.

*US Patent 7,225,135
Specifications

Frequency selection: 1024 Frequencies in 25kHz steps
Operating Frequencies (MHz):
- Block 470: 470.100 - 495.600
- Block 19: 486.400 - 511.900
- Block 20: 512.000 - 537.500
- Block 21: 537.600 - 563.100
- Block 22: 563.200 - 588.700
- Block 23: 588.800 - 614.100 / 614.300
- Block 24: 614.400 - 639.900
- Block 25: 640.000 - 665.500
- Block 26: 665.600 - 691.100

RF Power output: 100 mW (nominal)
Pilot tone: 25 to 32 kHz; 5 kHz deviation (in the 400 Series operating mode)
Frequency stability: ± 0.002%
Deviation: ± 75 kHz (max)
Spurious radiation: 60 dB below carrier
Equivalent input noise: –125 dBV (A-weighted)

Audio Performance (overall system):
Frequency Response: 35 Hz to 20 kHz (+/−1dB); Low frequency Roll-off: Adjustable for -3dB @30,50, 70 Hz
THD: 0.2% (typ. 100 Hz to 20 kHz - see graph)
SNR at receiver output:
<table>
<thead>
<tr>
<th>Mode</th>
<th>SmartNR</th>
<th>no limiting</th>
<th>w/limiting</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>103.5</td>
<td>108.0</td>
<td></td>
</tr>
<tr>
<td>NORMAL</td>
<td>107.0</td>
<td>111.5</td>
<td></td>
</tr>
<tr>
<td>FULL</td>
<td>108.5</td>
<td>113.0</td>
<td></td>
</tr>
</tbody>
</table>

Note: The dual envelope "soft" limiter provides exceptionally good handling of transients using variable attack and release time constants. Once activated, the limiter compresses 30+ dB of transmitter input range into 4.5 dB of receiver output range, thus reducing the measured figure for SNR without limiting by 4.5 dB.

Input Dynamic Range: 125 dB (with full Tx limiting)

Controls & Indicators:
- Power/Phantom “ON-OFF”
- Phantom voltage selector
- Audio input gain
- LCD w/membrane switches
- LED audio level indicators

Audio Input Jack: Standard 3-pin XLR (female)
Phantom Power: 5V @ 18 mA max., 15V @ 15 mA max. and 48 V @ 4 mA max., plus “OFF”
Antenna: Housing and attached microphone form the antenna
Battery: Two 1.5 Volt AA lithium or rechargeable NiMH recommended

Battery Life:

<table>
<thead>
<tr>
<th>Batteries</th>
<th>No Phantom*</th>
<th>48V On**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaline</td>
<td>5h 0m</td>
<td>3h 30m</td>
</tr>
<tr>
<td>NiMh 2500</td>
<td>9h 15m</td>
<td>7h 0m</td>
</tr>
<tr>
<td>Lithium</td>
<td>16h 0m</td>
<td>12h 45m</td>
</tr>
</tbody>
</table>

*Tested with a dynamic microphone
**Tested with a Sanken CS1 for a phantom-powered microphone

Weight: 7.5 ozs. (211 grams) w/ AA lithium batteries
Dimensions: 4.25x1.62x1.38 inches
Emission Designator: 180KF3E

The battery compartment door is hinged to the housing and remains attached to the transmitter when opened. It securely latches in place and applies pressure to the batteries when closed. The two AA batteries are connected in series through a conductive plate on the door.

Setup and adjustments are made with the control panel membrane switches and LCD. The transmitter can be powered up without the transmitter output enabled to allow frequency adjustments without causing interference to other wireless systems nearby. The switches can also be bypassed to prevent accidental changes.

Dual color LEDs indicate audio input level and the power LED changes color under low battery condition.