The Model 2015-146 Upconverter converts 140 ± 36 MHz to 14.0 to 14.5 GHz in 125 kHz steps with low group delay and flat frequency response. Synthesized local oscillators (LO) provide very low phase noise, ± 0.01 ppm stability frequency selection. Push button switches select the RF frequency, gain, and other parameters. Front panel LEDs provide indication of PLL alarm (red), remote operation (yellow) or the TX carrier is Muted (red). Variable attenuators for the IF input and RF output provide a gain range of 0 to +20 dB as adjusted by the front panel pushbutton switches. Remote operation allows selection of frequency and gain. Parameter selection and frequency and gain settings appear on the LCD display. Connectors are BNC (female) for IF, external reference input and 10MHz reference output, and SMA (female) for the RF output. The unit is powered by a 100-240 ±10% VAC power supply, and housed in a 1.75" X 19" X 16" 1RU chassis.

**EQUIPMENT SPECIFICATIONS**

**Input Characteristics**
- Impedance/Return Loss: 75Ω/18 dB
- Frequency: 140 ± 36 MHz
- Input Level: -30 to -10 dBm

**Output Characteristics**
- Impedance/Return Loss: 50Ω/15 dB
- Frequency (See Models): 14.0 to 14.5 GHz
- Output level: -30 to -10 dBm
- Output 1 dB compression: +5 dBm

**Channel Characteristics**
- Gain range (adjustable): 0 to +20 dB
- Spurious Response: <=50 dB
- Frequency Response: ±1.5 dB, 14.0-14.5 GHz; ±0.5 dB, 72 MHz BW
- Group Delay, max: 0.0035 ns/MHz², parabolic, 0.025 ns/MHz, linear, 1 ns ripple
- Frequency Sense: Non-inverting

**Synthesizer Characteristics**
- Frequency Accuracy: ±0.01 ppm internal reference; external reference input
- Frequency Step: 125 kHz minimum
- 10 MHz In/Out Level: 3 dBm, ±3 dB

**Phase Noise @ Freq**

<table>
<thead>
<tr>
<th>Freq</th>
<th>100Hz</th>
<th>1kHz</th>
<th>10kHz</th>
<th>100kHz</th>
<th>1MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>dB/Hz</td>
<td>-60</td>
<td>-70</td>
<td>-80</td>
<td>-90</td>
<td>-100</td>
</tr>
</tbody>
</table>

**Controls, Indicators**
- Freq/Gain Selection: direct readout LCD; pushbutton switches or remote selection
- Pwr; Alarm; Rem; Mute: Green LED; Red LED; Yellow LED; Yellow LED
- Remote: RS232C, 9600 baud

**Other**
- RF Connector: SMA (female)
- IF Connector: BNC (female)
- 10 MHz Connectors: BNC (female), 50Ω/75Ω
- Alarm/Remote Connector: DB9 - NO or NC contact closure on Alarm
- Size: 19 inch, 1RU standard chassis 1.75" high X 16.0" deep
- Power: 100-240 ±10% VAC, 47-63 Hz, 45 watts max

*10°C to 40°C; Specifications subject to change without notice*