

HOLLAND
Electronics LLC

HMA-860H
AGILE MODULATOR

LIMITED WARRANTY

Holland Electronics LLC, warrants that the product enclosed with this Limited Warranty statement will conform to the manufacturer's specifications and be free of defects in the workmanship and material for a period of five years (5) from the date of original purchase.

WARRANTY PROCEDURE:

If the product appears to be defective contact Holland Electronics LLC. at (805) 339-9060. We will analyze the problem and offer solutions to prevent removing the unit from service. If the unit is to be returned for evaluation, you will be issued a Return Material Authorization (RMA) number.

Holland Electronics LLC will, at its option, repair or replace the defective unit, under warranty, without charge for parts or labor. This repair will be subject to charges if signs of tampering or misuse are detected. Incoming shipping costs will be the customers responsibility. Returns will not be accepted without an RMA number.

The warranty and remedy provided above are exclusive and in lieu of all other express warranties and unless stated herein, any statements or representations made by any other person or firm are void. The duration of any implied warranties of merchantability or fitness for a particular purpose on this product shall be limited to the duration of the express warranty set fourth above. Except as provided in this written warranty, Holland Electronics LLC shall not be liable for any loss, inconvenience, or damage, including direct, special, incidental, or consequential damages, resulting from the use or inability to use this product, whether resulting from breach of warranty or any other legal theory.

Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

To arrange for Warranty Service: Call Holland Electronics LLC. (805) 339-9060

IMPORTANT!!

WARNING: Holland Electronics LLC does NOT represent this product to be WATERPROOFED. To reduce risk of electrical shock, fire hazard, or damage to the unit, do not expose to rain or moisture.

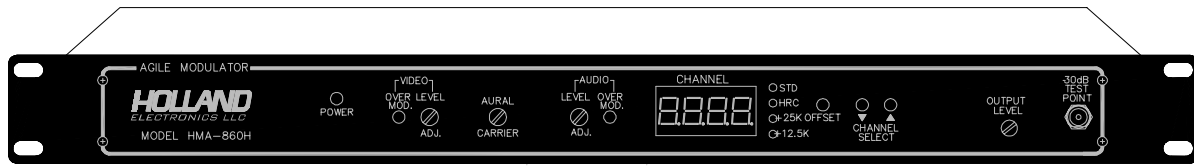
CAUTION: To prevent electric shock, do not use this plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

NOTE TO INSTALLER: This reminder calls the system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

WARNING:

TO PREVENT FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE

Specifications



Description

The HMA-860H is a microprocessor controlled rebroadcast quality, phase locked loop synthesized, frequency agile CATV television modulator. The double conversion and superior SAW filtering provides adjacent channel compatibility and spurious free output. The HMA-860H provides 60dB output level from 50 to 860 MHz including STD and HRC offset

frequencies. The channelization configuration can be changed by the up/down buttons located on the front panel. The modulator is shipped with all internal adjustments preset and FCC Docket 21006 offsets are standard. The unit conforms to FCC Docket 21006 for frequency accuracy.

Features

- Double heterodyne conversion
- SAW filtered
- Double I.F. loop; separate audio and video.
- Composite I.F. loop (45.75 MHz)
- Automatic band splitting filters for superior carrier to noise ratio.
- BTSC 4.5 MHz stereo capability
- Supports HRC, IRC, frequency offsets
- Front panel -30dB test point
- Five year warranty

Specifications

RF -----

| | |
|---|---|
| Channels: | 134 channels (2-135) |
| Frequency Range: | 54 - 860 MHz |
| Output Level: | 60 dBmV min., 62 dBmV typ. Ch. 2-78 57 dBmV min., 60 dBmV typ. Ch. 79-135 adjustable from front panel |
| Output Impedance: | 75 ohm |
| Audio/Video Ratio: | Adjustable -7 to -22 dB below video carrier |
| Frequency Stability: | ± 5 KHz in aeronautical band |
| Carrier to Noise (In-band): | >60 dB |
| Spurious Output (A/V Ratio @ -15dB): In Band | >65 dBc |
| Spurious Output: Outside Band (typical) | >60 dBc |

| | | |
|---------------------------|-------|-----------|
| Audio/Video Ratio: | Video | 45.75 MHz |
| | Audio | 41.25 MHz |

Video -----

| | |
|----------------------------|----------------------------------|
| Input Level: | 1 V p-p min. at 87.5% modulation |
| Input Level Range: | 0.5 to 1.5 p-p |
| Input Type: | Clamped video negative sync |
| Frequency Response: | ±0.8 dB, 30 Hz to 4.2 MHz |

| | |
|-------------------------------------|---------------------------|
| Differential Gain: | <5% (10 to 87.5% APL) |
| Differential Phase: | <5° (10 to 87.5% APL) |
| Chrominance Luminance Delay: | < ± 50ns |
| Hum and Noise: | -60 dB @ 87.5% modulation |
| Video Signal to Noise: | -60 dB minimum (weighted) |

Audio -----

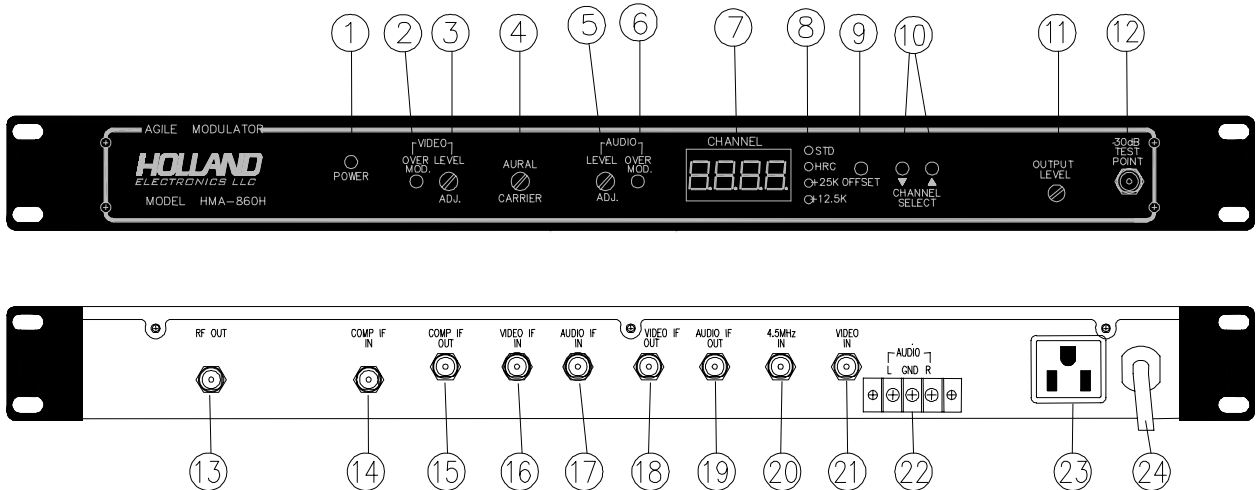
| | |
|----------------------------------|------------------------------------|
| Baseband Input Impedance: | 600 ohms unbalanced |
| Baseband Input Level: | 0.5 Vp-p for 25 KHz peak deviation |
| Pre-Emphasis: | 75 microseconds |
| Flatness: | -1.5dB max. 15 Hz to 15 kHz |

General -----

| | |
|-------------------------------|---|
| Power Input: | 100 - 240 VAC 60 Hz |
| Operating Temperature: | -10°C to +55°C |
| Dimensions: | 19"W × 9.375"D × 1.75"H |
| Weight: | 8 pounds |
| Connectors: | All "F" type except RCA type for baseband audio |

NOTE: Meets FCC group delay pre-distortion correction for color transmission.

Front & Rear Panels



- 1. Power On LED:**
Indicates power is on when lit.
- 2. Video modulation LED :**
Indicates video over-modulation when lit.
- 3. Video Modulation Adjust :**
Used to set video modulation level.
- 4. Video/Audio Ratio adjustment :**
Used to set level of audio carrier.
- 5. Audio Modulation Adjust :**
Used to set audio modulation level (volume).
- 6. Audio Modulation LED :**
Indicates aural over-modulation level when lit.
- 7. Channel Display :**
Indicates which channel is active.
- 8. Offset Indicator LED's :**
Indicates if standard or off-set formats are active.
- 9. Offset selector :**
Used to select standard or off-set formats.
- 10. Channel selectors :**
Used to select desired channel.
- 11. RF Level Adjust :**
Used to set RF level.
- 12. -30 dB Test Point :**
Used to monitor RF output level.
- 13. RF Output port :**
Connect this port to distribution system.
- 14. Composite I.F. Input :**
Input from I.F. scrambler or I.F. output.
- 15. Composite I.F. Output :**
To I.F. input or to scrambling device.
- 16. Video I.F. Input (45.75 MHz) :**
Video carrier I.F. input from video scrambling device or video carrier I.F. output.
- 17. Audio I.F. Input (41.25 MHz) :**
Sound carrier I.F. input from audio scrambling device or sound carrier I.F. output.
- 18. Video I.F. Output (45.75 MHz) :**
Video carrier I.F. output to scrambling device or video carrier I.F. input.
- 19. Audio I.F. Output (41.25 MHz) :**
Sound carrier I.F. to audio scrambling device or sound carrier I.F. input.
- 20. 4.5 MHz Input :**
Input for BTSC stereo encoder operation.
- 21. Video Input :**
Accepts any baseband video output source such as a satellite receiver, VCR, security camera or cable converter.
- 22. Audio Input (Left and Right) :**
Accepts any baseband audio output source such as a satellite receiver, VCR, security camera or cable converter.
- 23. Convenience Outlet :**
Standard U.S.A. type shown
- 24. Power Cord :**
Three wire, standard U.S.A. type.

Installation Procedure

Adherence to these precautions will help prevent problems during initial installation of the HMA-860H.

1. Connect the I.F. jumper from the I.F. output to the I.F. input on the rear panel. Connect I.F. jumper from the V.I.F. output to the V.I.F. input. Connect I.F. jumper from the S.I.F. output to the S.I.F. input.
2. Connect the HMA-860H to a 100 - 240 VAC grounded receptacle. Observe the lit LED light indicating power is on.
3. Using a signal level meter or spectrum analyzer, set the output level.
4. Check the aural carrier level. It should be set at 15 dBmv below the video carrier.
5. Connect a 1.0 volt peak-to-peak video source to the "VIDEO IN" on rear panel. Connect the HMA-860H "RF OUT" to a TV set, and compare the contrast and brightness to a known signal (use off-air signal to insure a proper modulation level). If necessary, adjust the video modulation until proper contrast is observed.
6. Connect an audio source to the "AUDIO IN" on rear of the unit. Set audio modulation (peak deviation) to 25 kHz with the audio modulation adjustment. A known off-air signal and a TV may be used to set adjustment for equal audio level.
7. Connect the "RF OUTPUT" to a proper combining network.

WARNING: When connecting the HMA-860H from the rear panel "RF OUT" directly to a TV set, attenuate the output sufficiently to prevent overdriving the TV or use the -30dB front panel test point for monitoring the modulator output.

Frequency Offsets

The federal Communications Commission requires that cable system modulators which operate in the aircraft communications and navigation bands be offset in frequency by 12.5/25.0 kHz. The HMA-860H

PLL oscillator is factory set to comply with FCC requirements for frequency accuracy (+/- 5 kHz) in the aeronautical communication and navigation bands.

| FREQUENCY | CHANNEL | NUMBER | OFFSET |
|----------------------|----------------|----------------|----------|
| 120 to 138 MHz ----- | A,B,C ----- | 14,15,16 ----- | 12.5 KHz |
| 108 to 120 MHz ----- | A-1, A-1 ----- | 99,98 ----- | 25 KHz |
| 228 to 330 MHz ----- | L – EE ----- | 25-41 ----- | 12.5 KHz |
| 330 to 336 MHz ----- | FF ----- | 42 ----- | 25 KHz |
| 336 to 404 MHz ----- | GG-QQ ----- | 45-53 ----- | 12.5 KHz |