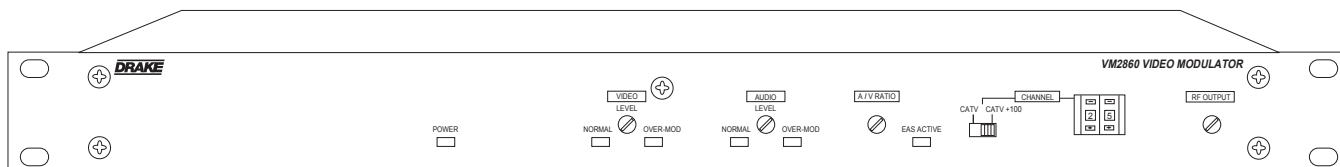


VM2860 / VM2862 Commercial Video Modulator



DESCRIPTION

The R.L. Drake VM2860 and VM2862 Video Modulators are high quality, vestigial sideband units with synthesized visual and aural carriers. They are designed to accept NTSC video and audio baseband signals from a satellite receiver or similar equipment. Front panel video and audio level controls with accompanying modulation indicators permit easy setup of the proper modulation levels. The A/V ratio and RF output level controls are also provided on the front panel. A rear panel EAS alternate IF input is also provided. The VM2860 model is for applications with mono audio and the VM2862 model provides BTSC stereo encoded audio. If SAP is required, this option is available for the VM2862 model, and is field installable.

Synthesized operation provides complete frequency agility, allowing front panel selection of any standard CATV channel from 2 to 135 (54 to 862 MHz band). FCC required offsets for aeronautical channels are automatically provided for each channel that requires an offset. For special applications, IRC or HRC CATV frequencies or off-air broadcast frequencies can be selected after moving an internal jumper.

A high quality IF SAW filter with FCC predistortion eliminates adjacent channel interference and provides optimum delay characteristics.

An auto-switching alternate IF input, labeled EAS input, is provided for connection of an Emergency Alert System 44 MHz IF signal. When the EAS IF signal appears at the EAS input, the main video and audio modulated IF is replaced by the EAS input signal.

A 4.5 MHz video trap may be selected via an internal jumper (VM2862 has 4.5 MHz trap on as factory setting). This may be used to filter off a 4.5 MHz sound subcarrier or undesired video components to prevent interference to the stereo or SAP channels.

The RF section of the modulator contains bandpass filtering that divides the 54 to 862 MHz output range into four bands, each approximately 200 MHz wide. This filtering, in conjunction with the use of high level, low noise floor mixing, ensures very low broadband noise at the output. Thus a full complement of up to all 134 available channels from VM2860 or VM2862 modulators may be combined while maintaining an excellent C/N of each channel. All of the mentioned features, combined with a carefully designed low noise and low distortion output stage, provide reliable operation in a densely crowded SMATV or CATV environment.

The inclusion of a fan in the VM2860 and VM2862 permits rack mounting of this equipment without leaving the typical 1U air space between modulators.

SPECIFICATIONS - VM2860 / VM2862

RF

Frequency Range: 54 MHz to 864 MHz.
Standard CATV channels 2 to 135.
Broadcast, HRC, and IRC channel plans available by internal jumper.

FCC Offsets: Automatic, positive.

Output Level: +60 dBmV minimum, 12 dB minimum adjustment range.

Amplitude Stability: ± 1 dB.

Output Impedance: 75 Ohms, 12 dB return loss within output filter passband.

A/V Ratio: -12 dB to -25 dB.

Frequency Stability: ± 5 ppm. All oscillators locked to the same internal reference.

Spurious Outputs: -60 dBc at +60 dBmV output level, 5 MHz to 1000 MHz, 15 dB A/V ratio.

Phase Noise: -85 dBc at 10 kHz offset.

Output Filter Bands: 54 MHz to 258 MHz, 258 MHz to 462 MHz, 462 MHz to 660 MHz, 660 MHz to 864 MHz.

Broadband Noise: -80 dBc, 4 MHz bandwidth, +60 dBmV output level, ± 18 MHz offset within output filter passband, -90 dBc outside of output filter passband, output filtered into 4 approximately 200 MHz wide bands.

VIDEO

Input Level: 1 Vp-p ± 3 dB, manual gain adjustment with modulation indicators.

Input Impedance: 75 Ohms, 25 dB return loss.

Frequency Response: 20 Hz to 4.2 MHz, ± 1 dB with 4.5 MHz trap off, 20 Hz to 4.1 MHz, ± 1 dB with 4.5 MHz trap on.

In-channel C/N: 65 dB.

L/C Delay: ± 50 nS of FCC predistortion with 4.5 MHz trap off,

-20 +80 nS of FCC predistortion with 4.5 MHz trap on.

Differential Gain: $\pm 3\%$.

Differential Phase: $\pm 3^\circ$.

MONO AUDIO

Input Level: 250 mVrms to 2.5 Vrms, manual gain adjustment with LED modulation indicators.

Input Impedance: 10K Ohms, unbalanced.

MONO AUDIO, cont'd.

Pre-emphasis: 75 μ S.

Frequency Response: 50 Hz to 15 kHz, ± 1 dB.

THD: 0.5% maximum.

S/N: 65 dB.

BTSC STEREO AUDIO (VM2862 only)

Input Level: 250 mVrms to 2.5 Vrms, manual gain adjustment with LED modulation indicators.

Input Impedance: 10K Ohms, unbalanced.

Separation: 30 db, 50 Hz to 12.5 kHz; 25 dB, 12.5 kHz to 14 kHz.

Frequency Response: ± 0.5 dB, 50 Hz to 14 kHz.

THD: 0.5% maximum.

S/N: 65 dB.

SAP AUDIO Option (VM2862 only)

Input Level: 250 mVrms to 2.5 Vrms, manual gain adjustment with over-modulation indicator.

Input Impedance: 10K Ohm, unbalanced.

Frequency Response: ± 2 dB, 50 Hz to 10 kHz.

THD: 1% maximum.

S/N: 80 dB.

EAS INPUT

Level: +30 dBmV, ± 1 dB (visual carrier).

Impedance: 75 Ohm, 20 dB return loss.

Isolation: 60 dB.

Auto Switching Level: +20 dBmV.

GENERAL

AC Power: 115 VAC $\pm 10\%$, 60 Hz, 23 Watts (VM2860), 28 Watts (VM2862).

Fuse: 1/2 Amp Slo-Blo 5 X 20 mm.

Temperature Range: 0° to 50° C.

Cooling: Internal 1.85 CFM fan allows operation in the rack without air spaces between units.

Radiated Emissions: FCC Part 15.

Size: 11.25" D x 1.75" H x 19" W

Weight: 8 lbs. 8 oz.

Order From:



800-423-2594

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Front Panel Controls and Indicators

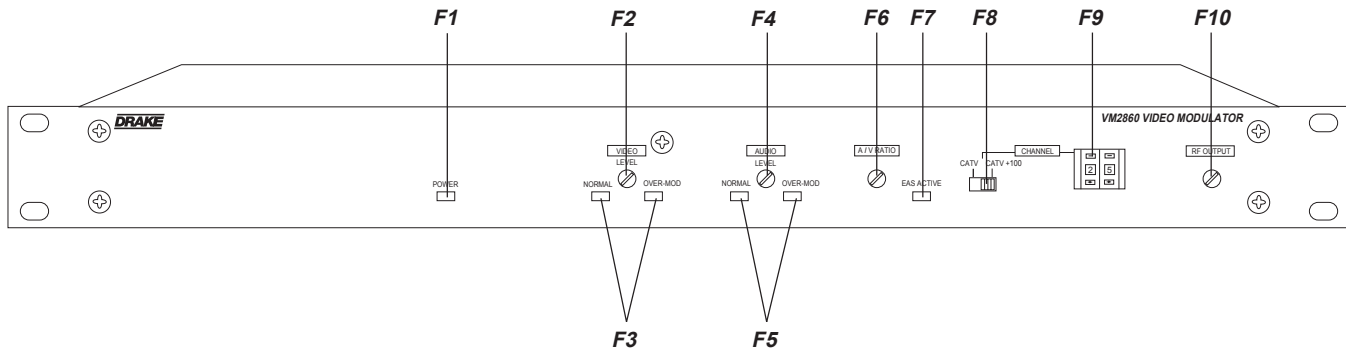


Figure 1 - FRONT PANEL

F1 - POWER Indicator

This LED lights when the unit is connected to a source of AC power. The LED flashes when on an invalid channel or if there is a synthesizer error.

F2 - VIDEO LEVEL Control

The setting of this screwdriver adjustment determines the video modulation level. Clockwise rotation increases the depth of modulation. After installing the unit, and with a nominal 1 Vp-p video source connected, adjust the VIDEO LEVEL control to a point where the red LED modulation indicator (see item F3) just remains off (87.5% depth of modulation). It is normal for the green modulation indicator to be on with only sync level video input.

F3 - MODULATION Indicators (Video)

The green LED will be turned on continuously with sync level or higher video input. An overmodulation condition is noted with the red LED turned on continuously. The VIDEO LEVEL control should be set to a point where the red LED just remains off (see item F2).

F4 - AUDIO LEVEL Control

The setting of this screwdriver adjustment determines the audio deviation level. Clockwise rotation increases the level. After installing the unit and with the audio source connected, adjust the AUDIO LEVEL control to a point where the green LED is turned on continuously and the red LED just remains off (25 kHz peak deviation).

F5 - MODULATION Indicators (Audio)

The green LED will be turned on continuously for peak deviations of approximately 2.5 kHz (10% of 25 kHz maximum) or greater. An overmodulation condition is noted with the red LED turned on continuously. The AUDIO LEVEL control should be set to a point where the red LED just remains off (see item F4).

F6 - A/V RATIO Control

This screwdriver adjustment varies the level of the aural carrier over a range from 12 to 25 dB below the visual carrier. The aural carrier should be adjusted to approximately 15 dB below the visual carrier (normal operation). Clockwise rotation increases the aural carrier level and thus decreases the A/V ratio.

F7 - EAS ACTIVE Indicator

This indicator lights when a signal is present at the EAS input (R2) indicating that the modulator has switched to the EAS signal.

F8 - CATV, CATV +100 CHANNEL Switch

This two position switch allows selection of the desired operating channel from 02 to 99 (when the switch is in the CATV position) and channels 100 to 135 (when the switch is in the CATV +100 position). See the CHANNEL ASSIGNMENTS section for a list of the corresponding operating frequency, and offset, if any, for each channel number.

F9 - CHANNEL Switch

These pushwheel switches allow the selection of the desired operating channel from 01 to 135. See the CHANNEL ASSIGNMENTS section for a list of the corresponding operating frequency, and offset, if any, for each channel number.

F10 - RF OUTPUT LEVEL Control

This screwdriver adjustment varies the RF OUTPUT level. Clockwise rotation increases the level.

Rear Panel Controls and Connections

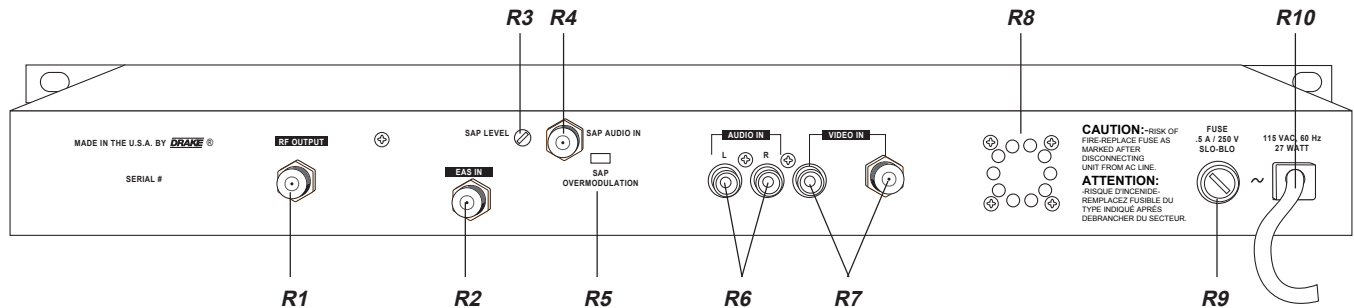


Figure 2 - REAR PANEL

R1 - RF OUTPUT

This is the modulator output, 54 to 864 MHz.

R2 - EAS IN Connector

Apply a 44 MHz (45.75 MHz video carrier) signal at 30 dBmV to this input from an EAS IF modulator. Any level above +20 dBmV will activate the auto switching circuitry.

R3 - SAP Level *

Adjusts the modulation level of the SAP subcarrier. Advance level until indicator R5 just illuminates.

R4 - SAP AUDIO IN *

Apply the audio program for the SAP audio channel to this input.

R5 - SAP OVERMODULATION *

Indicates overmodulation of the SAP audio channel. Adjust audio with SAP level control, R3.

R6 - AUDIO IN, L/R

These are unbalanced audio inputs to the IF circuits. These "RCA" (phono) connector inputs accept baseband through 15 kHz audio at a nominal level of 250 mV RMS (approximately -10 dBu).

R7 - VIDEO INPUT ("RCA" type or "F" type)

These are used as the baseband input to the IF circuits. Use ONE of these inputs (either the "RCA" or "F" type) which accepts baseband through 4.2 MHz video at levels from 0.7 Vp-p to 1.5 Vp-p.

R8 - Fan Vents

To ensure proper cooling of the unit, do not block these vents for the cooling fan.

R9 - FUSE

Always replace this fuse with one of the same type and rating: .5 Amp, 250 V SLO-BLO®, 5 x 20 mm type.

R10 - LINE CORD

This is a three-wire power cable. When the cable is connected to a properly wired AC power line outlet, this cable grounds the instrument cabinet. Connect to a nominal 115 VAC $\pm 10\%$, 60 Hz source. Do not defeat the safety purpose of the center ground prong on the attached line cord plug.

* SAP option must be installed in the VM2862.

The SAP option may be field installed, by a qualified technician, into a VM2862.

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