

# CAM Series

## Channelized Agile Audio/Video Modulators



### ○ Features & Benefits

- EAS/ALT IF Ready Via Manual or Automatic Mode
- Front Panel Accessible Level Controls for Easy Set-Up and Adjustments
- Rack Mountable - 1 EIA (1.75") Rack Space
- Exceptional Broadband Noise Performance of -110 dBc
- -60 dBc Spurious Response for the Entire Level Range
- Works in Conjunction with High Performance Channelized Output Filter Modules (OFM)

The CAM-60 Series are professional quality, channelized agile, heterodyne audio/video modulators. These units provide audio and video modulated RF carrier output on any SUB, VHF, UHF, or CATV channel (7 to 450 MHz and 50 to 860 MHz). Any standard audio/video source can be used, such as satellite receivers, television cameras, video tape recorders, or television demodulators. These modulators feature a frequency agile output converter and provide +60 dBmV output. A low cost, removable single channel output filter module is used to provide channelized configuration of the CAM-60 Series. Stocking distributors can maintain an inventory of mainframes and a mix of output filter modules. Customer requests for individual channels can be easily accomplished by combining the frequency agile mainframe with the desired removable output filter module.

Several models are available, including: CAMS-60, Single IF Modulator; CAMS-60-MF, Single IF Mainframe; CAMD-60, Dual IF Modulator; CAMD-60-MF, Dual IF Mainframe; and OFM-60-860, Output Filter Module. The CAMS-60 comprises one CAMS-60-MF Single IF Mainframe and one OFM-60-860 Output Filter Module for the desired VHF, CATV, or UHF channel. The CAMD-60 comprises one CAMD-60-MF Dual IF Mainframe and one OFM-60-860 Output Filter Module for the desired VHF, CATV, or UHF channel.

The CAM-60 Series takes baseband audio and video and modulates these signals onto the desired output channel (each modulator has separate audio and video inputs). The heterodyne conversion process used in the CAM-60 Series employs a crystal referenced, PLL synthesized local oscillator, with a 12.5 kHz tuning increment. This guarantees rock solid, no-drift output for the life of the modulator. A custom SAW filter is employed to provide true vestigial sideband selectivity with built-in FCC group delay pre-distortion. The CAMD-60 models provides separate external visual and aural IF loops. An external IF loop is provided, which allows interfacing with video all-call and signal scrambling systems while CAMD-60 models have dual IF loops. The CAM-60 Series meets FCC Docket 21006 aeronautical frequency offset requirements ( $\pm 5$  kHz video carrier accuracy) and accepts standard polarity (sync negative) video in the range of 0.7 to 2.8 V p-p. A4.5 MHz audio input is provided, which preserves the stereo audio available from most satellite receivers and demodulators. A rear panel switch allows selection of either baseband audio or 4.5 MHz audio. An optional integrated BTSC encoder module is also available.

### **Output Filter Modules (OFM)**

Output Filter Modules are factory tuned channelized units that are used with the CAM, CAP, MAVM & SAIP product lines. They are available with +40 dBmV or +60 dBmV output levels and can be order for any channel in the CATV (2-135), UHF (14-69) or Sub-Band (T7-T11) channel ranges.

**Specifications and Ordering Information are located on the following pages.**

*Available through* **Multicom, Inc.** 1076 Florida Central Parkway, Longwood, FL 32750

Ph: 407-331-7779 Toll Free: 800-423-2594 Fax: 407-339-0204

[www.multicominc.com](http://www.multicominc.com)

# CAM Series

## Channelized Agile Audio/Video Modulators

### ○ Specifications

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#### RF

Frequency Range  
VHF, UHF, CATV: 54-860 MHz  
SUB BAND: 7-37 & 54-450 MHz

Channels: SUB, VHF, CATV, UHF

Output Level - Min: +60 dBmV

Output Level Adjust: 15 dB

Aural/Visual Carrier Ratio: -9 to -20 dB

Visual Sub Carrier Frequency Tolerance  
Standard Channels:  $\pm 5$  kHz  
FCC Aeronautical Channels:  $\pm 3$  kHz

Aural Carrier Frequency  
Offset from Visual Carrier: +4.5 MHz  
Tolerance:  $\pm 100$  Hz

Channel Selectivity:  
Adjacent Aural and Below: -42, min dB  
Adjacent Picture and Above: -45, min dB

Spurious Outputs: -60 dBc

C/N Ratio In Channel: 68 dB

Broadband Noise: -110 dBc

Output Impedance: 75 Ohm

Output Return Loss: 18 dB

#### IF

Aural Frequency: 41.25 MHz

Visual Frequency: 45.75 MHz

Separate IF Loops:  
Aural Loop Level: +30 dBmV  
Visual Loop Level: +40 dBmV

Composite IF Loop Output  
Aural Carrier Level: +20 dBmV  
Visual Carrier Level: +35 dBmV

Output/Input Impedance: 75 Ohm

Output Return Loss: 18 dB

Input Return Loss: 18 dB

#### Video

Input Level: 1.0 V p-p

Frequency Response  
fv-0.5 MHz to fv+4.2 MHz:  $\pm 0.5$  dB

P-P Video to RMS Hum Ratio: 65 dB

Video Signal-to-Noise Ratio, Weighted: 64 dB

Differential Gain: 2.0 %

Differential Phase: 1.0 °

Over Modulation Indicator: 87.5,  $\pm 2.5$  %

Input Impedance: 75 Ohm

Input Return Loss: 30 dB

#### Audio

Input Level: -10 to +10 dBm

Ext. 4.5 MHz Input Level: +40 dBmV

Frequency Response  
Mono (30 Hz to 15 kHz):  $\pm 0.5$  dB  
Stereo (50 Hz to 10 kHz): 1.5 dB

Pre-Emphasis-Mono: 75  $\mu$ s

Audio Signal-to-Noise  
Mono @ 25 kHz Deviation: 64 dB  
Stereo @ 50 kHz Deviation: 60 dB

Total Harmonic Distortion: 0.6 %

Over Modulation Indicator: 25  $\pm 2$  kHz

Input Impedance: 600, Balanced Ohm

#### General

Power Requirements  
Voltage: 117,  $\pm 10\%$  VAC  
Frequency: 60 Hz  
Power - CAMS-60: 14 W  
Power - CAMD-60: 16 W

Fuse  
CAMS-60: 1/4 A  
CAMD-60: 3/8 A

Temperature Range: 0 to +50 °C

#### Mechanical

Dimensions (WxHxD)  
CAMS-60: 19.0 x 1.75 x 14.5 in.  
(483 x 44 x 368) mm  
CAMD-60: 19.0 x 1.75 x 14.5 in.  
(483 x 44 x 368) mm

Weight  
CAMS-60: 6 lbs. (2.73 kg)  
CAMD-60: 6 lbs. (2.73 kg)

#### Connectors (Rear Panel)

Video Input: "F" type, female

Audio Input  
Standard - Mono: Barrier Strip  
Optional - Stereo: Barrier Strip

4.5 MHz Input: "F" Type, Female

Aural IF Output: "F" Type, Female

Aural IF Input: "F" Type, Female

Visual IF Output: "F" Type, Female

Visual IF Input: "F" Type, Female

Composite IF Output: "F" Type, Female

Composite IF Input: "F" Type, Female

RF Output: "F" Type, Female

#### Connectors (Front Panel)

-20 dB Test Port: "F" Type, Female

#### Controls (Front Panel)

Video Level: Control

Aural Carrier Level: Control

Audio Level  
Standard - Mono: Control  
Optional - Stereo: Control

RF Output Level: Control

#### Indicators (Front Panel)

Power ON: LED Green

Video Over Modulation: LED, Red

Audio Over Modulation: LED, Red

External IF (Optional): LED, Green

External Reference (Optional): LED, Green

BTSC Stereo (Optional): LED, Red

Refer to product instruction manual for additional specification measurements and notes.

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### ○ Ordering Information

Model	Stock No.	Description
CAMD-60	7895 300	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 54-300 MHz, Dual IF L
CAMD-60	7895 756	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 300-756 MHz, Dual IF Loops
CAMD-60	7895 860	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 756-860 MHz, Dual IF Loops
CAMD-60	S7895 49	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 7-49 MHz (SUB), Dual IF Loops
CAMD-60	U7895 758	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 470-758 MHz (UHF), Dual IF Loops
CAMD-60	U7895 806	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 758-806 MHz (UHF), Dual IF Loops
CAMD-60S	7895S 300	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 54-300 MHz, Dual IF Loops
CAMD-60S	7895S 756	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 300-756 MHz, Dual IF Loops
CAMD-60S	7895S 860	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 756-860 MHz, Dual IF Loops
CAMD-60S	S7895S 49	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 7-49 MHz (SUB), Dual IF Loops
CAMD-60S	U7895S 758	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 470-758 MHz (UHF), Dual IF Loops
CAMD-60S	U7895S 806	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 758-806 MHz (UHF), Dual IF Loops
CAMD-60S-MF	7896	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 860 MHz, Dual IF Loops, Mainframe
CAMD-60S-MF	7896S	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 860 MHz, Dual IF Loops, Mainframe
CAMD-60S-MF	S7896	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 7-450 MHz, Dual IF Loops, Sub-Band Mainframe
CAMS-60	5895 300	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 54-300 MHz, Single IF Loop
CAMS-60	5895 756	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 300-756 MHz, Single IF Loop
CAMS-60	5895 860	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 756-860 MHz, Single IF Loop
CAMS-60	S5895 49	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 7-49 MHz (SUB) Single IF Loop
CAMS-60	U5895 758	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 470-758 MHz (UHF), Single IF Loop
CAMS-60	U5895 806	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 758-806 MHz (UHF), Single IF Loop
CAMS-60-MF	5896	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 860 MHz, Single IF Loop, Mainframe
CAMS-60-MF	S5896	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 7-450 MHz, Single IF Loop, Sub-Band Mainframe
CAMS-60S	5895S 300	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 54-300 MHz, Single IF Loop
CAMS-60S	5895S 756	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 300-756 MHz, Single IF Loop
CAMS-60S	5895S 860	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 756-860 MHz, Single IF Loop
CAMS-60S	S5895S 49	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 7-49 MHz (SUB), Single IF Loop
CAMS-60S	U5895S 758	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 470-758 MHz (UHF), Single IF Loop
CAMS-60S	U5895S 806	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 758-806 MHz (UHF), Single IF Loop
CAMS-60S-MF	S996S	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 860 MHz, Single IF Loop, Mainframe
CAMS-60S-MF	S5996S	Channelized Agile Integrated Stereo Audio/Video Modulator +60 dBmV, 7-450 MHz, Single IF Loop, Sub-Band Mainframe

### Output Filter Modules (OFM)

Model	Stock No.	Description
OFM-40-860	U7984A 806	Output Filter Module +40 dBmV, 758-806 MHz (UHF)
OFM-40-860	U7984A 758	Output Filter Module +40 dBmV, 470-758 MHz (UHF)
OFM-40-860	S7984A 37	Output Filter Module +40 dBmV, 7-37 MHz (SUB)
OFM-40-860	7984A 860	Output Filter Module +40 dBmV, 756-860 MHz
OFM-40-860	7984A 300	Output Filter Module +40 dBmV, 54-300 MHz
OFM-40-860	7984A 756	Output Filter Module +40 dBmV, 300-756 MHz
OFM-60-860	U7985A 758	Output Filter Module +60 dBmV, 470-758 MHz (UHF)
OFM-60-860	U7985A 806	Output Filter Module +60 dBmV, 758-806 MHz (UHF)
OFM-60-860	S7985A 37	Output Filter Module +60 dBmV, 7-37 MHz (SUB)
OFM-60-860	7985A 860	Output Filter Module +60 dBmV, 756-860 MHz
OFM-60-860	7985A 756	Output Filter Module +60 dBmV, 300-756 MHz
OFM-60-860	7985A 300	Output Filter Module +60 dBmV, 54-300 MHz

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