

MPCMA

Universal-Chassis Agile A/V Mini-Modulator



Installation and Operation Manual

MPCMA

Product Inspection

Inspect the equipment for shipping damage. Should any damage be discovered, immediately file a claim with the carrier.

Important Safety Instructions

To insure proper installation and operation, take a moment to read this guide before proceeding with the installation. If you have any questions or comments about the **MPCMA** mini-modulator, please contact your dealer or have him contact the **PICO MACOM** Service Center at these phone numbers: 800-421-6511, 818-493-4300.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

CAUTION:

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION:

POUR PREVENIR LES CHOCS ELECTRIQUES, NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

1. Read Instructions: All safety and operating instructions should be read before the appliance is operated.

2. Retain Instructions: The safety and operating instructions should be retained for future reference.

3. Heed Warnings: All warnings on the appliance should be adhered to.

4. Follow Instructions: All operating and user instructions should be followed.

5. Cleaning: Unplug this appliance from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleansers.

6. Do Not Use Attachments: Use of attachments not recommended by the manufacturer may cause hazards.

7. Water and Moisture: Do not use this product near water—for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool—and the like.

8. Accessories: Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the appliance.

9. Ventilation: This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to. Any slots or opening in the cabinet are provided for ventilation. To ensure reliable operation of the video product and to protect it from overheating, these openings must not be blocked or covered. Openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface.

10. Grounding or Polarization: This video product is equipped with either a three prong plug for 110 VAC use or a two prong flat blade 220 VAC type plug. Each type is to be inserted into only the type of receptacle for which they specifically designed. **Do not** cut off the round grounding pin in order to be able to fit into a two prong receptacle as this could cause injury and will void the warranty.

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11. Power Sources: This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your appliance dealer or local power company.

12. Power-cord Protection: Power-supply cords should be routed so they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.

13. Lightning: For added protection for this product during a lightning storm, or when it is left unattended or unused for long periods of time, the unit should be disconnected from power source.

14. Power Lines: An outside antenna system should not be located in the vicinity of overhead power lines, other electric light or power circuits, where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them may be fatal.

15. Overloading: Do not overload wall outlets and extension cords as this can result in risk of fire or electric shock.

16. Object and Liquid Entry: Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

17. Servicing: Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

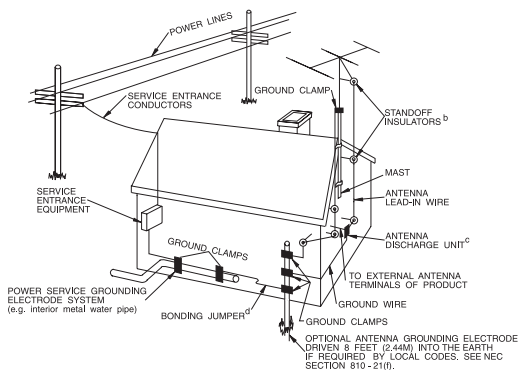
18. Damage Requiring Service: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power-supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the product.
- If the product has been exposed to rain or water.
- If the product does not operate normally by following the operating instruction. Adjust only those controls that are covered by the operating instructions. An improper adjustment may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- If the product has been dropped or the cabinet has been damaged.
- When the product exhibits a distinct change in performance—this indicates a need for service.

19. Replacement Parts: When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original parts. Unauthorized substitutes may result in fire, electric shock or other hazards.

20. Safety Check: Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating conditions.

EXAMPLE OF ANTENNA GROUNDING ACCORDING TO NATIONAL ELECTRICAL CODE INSTRUCTIONS CONTAINED IN ARTICLE 810-"RADIO AND TELEVISION EQUIPMENT"



21. Outdoor Antenna Grounding: Before attempting to install this product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges.

- Use No.10 AWG (5.3mm) copper, No.8 AWG (8.4mm) aluminum, No.7 AWG (10mm) copper-clad steel or bronze wire or larger, as ground wire.
- Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4 feet (1.22m) to 6 feet (1.83m) apart.
- Mount antenna discharge unit as close as possible to where lead-in enters house.
- A driven rod may be used as the grounding electrode where other types of electrode systems do not exist. Refer to the National Electrical Code, ANSI/NFPA 70-1984 for information.
- Use jumper wire not smaller than No.6 AWG (13.3mm) copper or equivalent, when a separate antenna grounding electrode is used.

NOTE TO THE CATV SYSTEM INSTALLER

THIS REMINDER IS PROVIDED TO CALL THE CATV 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.

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Universal-Chassis Agile A/V Mini-Modulator

- 135-Channel Range 54-860 MHz (CATV 2-135)
- >45dBmV min adjustable output for optimum carrier-to-noise performance
- Compatible with most manufacturers mini-modulator chassis
- State-of-the-art digital phase-locked-loop (PLL) design guarantees precise frequency locking for solid drift-free operation
- Microprocessor control enables quick digital push-button channel selection for ease of installation, configuration, and improved system uptime
- SAW (surface acoustic wave) filtered for superior adjacent channel performance enables drop-in channel expansion
- BTSC stereo compatible pre-emphasis disable switch provides pass-through for stereo signals
- In-band carrier-to-noise ratio >65dB ensures superior picture quality
- Automatic selection of aeronautical offsets (12.5kHz, 25kHz) for trouble-free configuration
- Front panel access to controls enables easy setup
- IRC and HRC offset available for frequency settings in systems using offset channels



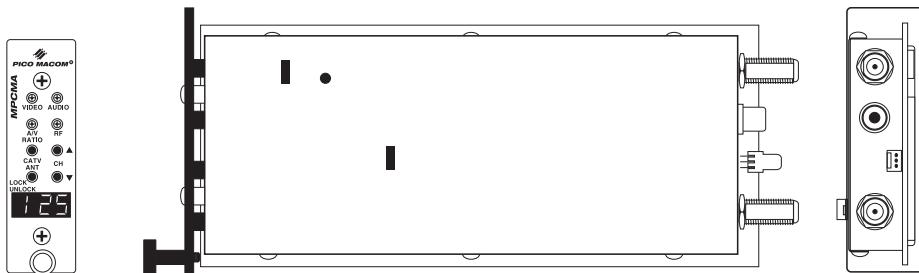
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The **MPCMA** is a professional grade microprocessor-controlled agile audio/video mini-modulator. This modulator accepts any audio-video baseband television signal and provides a 45dBmV minimum output on CATV channels 2 to 135 (54-860 MHz) while accommodating HRC and IRC offset frequencies. Channel selection is easily accomplished via channel up/down buttons located on the front panel while built-in RF muting circuitry prevents interference during online channel reassignment. This **MPCMA** features >90dB out-of-band carrier-to-noise ratio, allowing virtually unlimited numbers of **MPCMA**'s to be combined in a system without the need for external bandpass filtering. Up to 12 or 16 units can be installed "mix-and-match" in Pico Macom's **MPC12**, **MPS12**, **MPC12R** or **MPC16** chassis with **MPSM45** and **MPCM45** mini-modulators or **MPCD** mini-demodulators. Its unique design enables it to be installed in other manufacturers' mini-mod chassis. The unit's tracking filter technology and double-heterodyne conversion ensure accurate and spurious-free output. The **MPCMA** uses SAW filtering in conjunction with FCC group delay correction circuitry to provide superior adjacent channel selectivity. The unit's PLL circuitry in conjunction with the non-volatile memory contained in the microprocessor ensures easy and reliable channel selection and restoration. The **MPCMA** modulator is shipped with all internal adjustments preset. Pico Macom backs up this product with its industry leading 5-year limited warranty.

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RF

Channels:	135 Channels
Frequency Range:	54-860 MHz (CATV Ch. 2-135)
Output Impedance:	75 Ohms
RF Output Level:	45 dBmV, adjustable from front panel (min.)
Output Return Loss:	-15 dB
Audio/Video Ratio:	Adjustable -7 to -22 dB below video carrier
Frequency Stability:	±5 kHz in aeronautical band; conforms to FCC Docket 21006
Spurious Output:	-60 dB below video carrier with A/V ratio @ 15 dB
C/N (In-Band):	>65 dB
C/N (Out-Of-Band):	>90 dB
Fv-6 MHz (Upper Adj. Rejection):	>-60 dBc
Fv-1.5 MHz (Lower Adj. Rejection):	>-60 dBc
I.F. Frequency:	Video 45.75 MHz Audio 41.25 MHz

Audio

Hum And Noise:	-60 dB @ 87.5% modulation
Audio Baseband Input Impedance:	600 Ohms
Audio Baseband Input Level:	0.5 V p-p for 25 kHz peak deviation
Preemphasis:	75 microsecond
Flatness Audio:	1.5 dB (50 Hz to 15 kHz)

Video

Video Input Level:	1 V p-p minimum for 87.5% modulation
Video Input Type:	Clamped video negative sync
Video Frequency Response:	±0.8 dB, 30 Hz to 4.2 MHz
Differential Gain:	<5% (10 to 90% APL)
Differential Phase:	<5° (10 to 90% APL)
Chrominance Luminance Delay:	<50 nsec, standard or FCC predistortion option

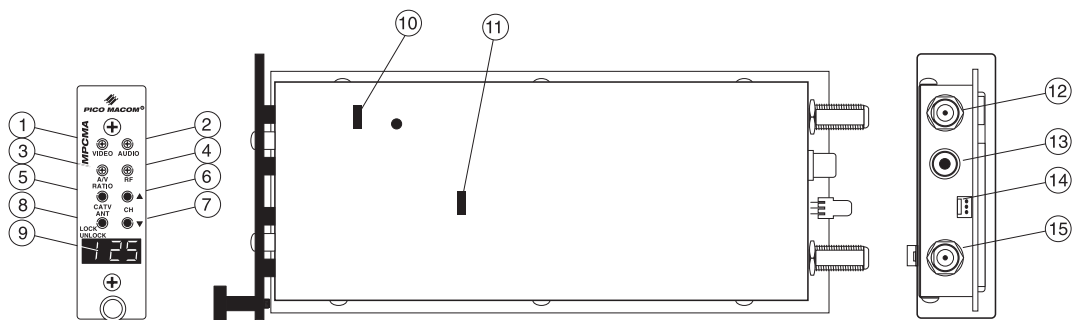
General

Dimensions:	1"(W) x 8"(D) x 3.45"(H)
Weight:	0.8 lbs.
Power Input:	5 VDC, 12 VDC @ .25A
Operating Temperature:	-10° C to 50° C
Connectors:	Video In/RF Out "F" type Audio In RCA

Ordering Information

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Panels

1. **Video Level Control:**
Use this control to adjust the video modulation level (picture quality).
2. **Audio Level Control:**
Use this control to adjust the audio modulation level (volume).
3. **Audio /Video Ratio Control:**
Used to set the level of the audio carrier in relation to the video carrier.
4. **RF Output Level Control:**
Used to set output level.
5. **CATV/ANT:**
Push this button to select either CATV or TV mode.
6. **Channel Select:**
Push this button to change channel to higher number.
7. **Channel Select:**
Push this button to change channel to lower number.
8. **Channel Lock Control:**
Switch is used to prevent accidental change of channel.
9. **Channel Display:**
Indicates selected channel and that power is on when lit.
10. **HRC, IRC Off-set Control:**
Slide switch selects standard, HRC and IRC frequencies.
11. **Pre-emphasis on/off:**
Allows preemphasis to be disabled when used with BTSC generator.
12. **Video Input:**
Accepts video output from satellite receiver, VCR and CCTV camera.
13. **Audio Input:**
Accepts audio output from satellite receiver and VCR.
14. **DC Power Inputs:**
The three-wire power cable from the power supply connects to this jack.
15. **RF Output:**
Connect this port to distribution system.

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Installation

Use a small plastic screwdriver to make required selection of switches and buttons

1. If module is to be used in an HRC or IRC CATV frequency assignment, slide the format assignment switch inside the side of module to HRC or IRC. (Unit is shipped with this switch in the STD position)
2. If the audio source is BTSC stereo, slide the preemphasis switch inside the side of module to off. (Unit is shipped with this switch in the on position)
3. Align the top and bottom edge of module with the guide channel in chassis.
4. Slide module into chassis.
5. Connect the 3 pin molex power supply connector.
6. Connect a cable between the module RF output connection and the channel-combining network.
7. Connect cables from the programming source baseband output to the audio and video input connectors of module.
8. If needed, press the CATV/ANT button to select between cable TV and off-air channel assignments.
9. Select the desired channel by pressing either channel button adjacent to the arrows on front panel.
10. When the desired channel is displayed, press the set button to lock channel.
11. Connect a signal level meter or spectrum analyzer to a common port of the channel combiner network.
12. Adjust RF output control on the front of modulator until the RF video carrier level matches the RF video level of adjacent channels.
13. Adjust the A/V ratio control on the front panel until the RF audio carrier level is between 13 and 17dB below the RF video carrier level.
14. Connect a television set to a common port of the channel combiner network.
15. Analyze the brightness of channel compared to adjacent channels.
16. If needed, adjust video control on the front of modulator until the brightness level matches the brightness of adjacent channels.
17. Analyze the sound level of channel compared to adjacent channels.
18. If needed, adjust audio control on the front of modulator until the sound level matches the sound of adjacent channels.

MODULE REPLACEMENT

1. Disconnect the 3 pin molex connector from module.
2. Disconnect the audio, video, and RF connectors from back of module.
3. Remove module by sliding the unit out the front of the chassis.
4. Insert replacement module into chassis.
5. Reconnect the 3 pin molex connector and audio, video, and RF connectors to the rear of module.
6. Set Channel Frequency, level and deviation controls as described in installation procedures.

OPERATION AND CARE

Do's & Don'ts

- Always operate in a cool well-ventilated environment.
- Always provide a stable, conditioned power source..
- Heed all safety warnings and obey all environmental and electrical operating requirements.
- To clean, use a damp cloth only and clean only with mild soap.
- Do not use solvents or harsh detergents.
- Do not use this product for purposes other than intended.

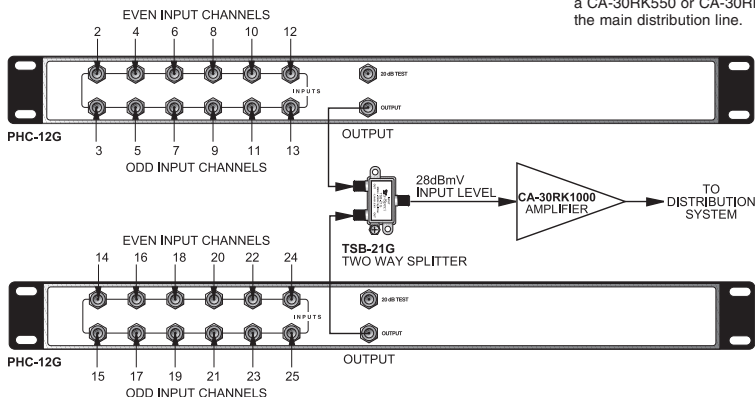
HEADEND/DISTRIBUTION INTERFACE

PICO MACOM recommends connecting the headend components in the following manner:

Each of the modulators, signal processors or strip amplifiers output are connected to a combining network. Either a PHC-12G or a PHC-24G headend combiner may be used to accomplish this purpose.

The PHC-12G or PHC-24G passive headend combiner consists of two rows of directional couplers combined by a hybrid splitter. Normally, the odd channels are combined on one row while even channels are combined on the other row of directional couplers for maximum isolation. The output of the combiners may be connected to the input of a launch amplifier such as a CA-30RK550 or CA-30RK1000. The output of the amplifier is connected to the main distribution line.

A 24 channel system hook-up is shown. (The same combining result may be accomplished by using a single PHC-24G). The two PHC-12G outputs are combined via a two-way splitter, which is connected to a CA-30RK1000 launch amplifier. The input levels to the combiner, whether from a modulator, signal processor or a strip amplifier, must be at the same amplitude.



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Limited Warranty

Pico Macom warrants to the original purchaser that all of its new products are of sound design, quality materials and workmanship at the time of manufacture and will be free from related defects for one year from the original purchase date. Pico Macom will repair or, at its discretion, replace without cost to the original purchaser, the product which, upon inspection by Pico Macom, appears to be defective or not conforming to factory specifications. Pico Macom will cover the cost of parts, labor, and return freight from factory.

Five-Year Limited Warranty

Most products designated as "Headend Electronics" are further covered by an extended 4-year period beyond the expiration of the original 1-year warranty, for a full 5-year period. Qualified equipment requiring factory repair during the extended 4-year period is covered under our re-certification program. Re-certification fees under this program shall not to exceed 20% of the product's List Price and whenever possible, Pico Macom will attempt to upgrade performance to the latest improved specification.

Warranty Limitations

This warranty excludes coverage of damage or inoperability resulting from (1) use or installation other than in strict accordance with Pico Macom's written instructions, (2) disassembly or repair by someone other than Pico Macom or a Pico Macom authorized repair center, (3) misuse, misapplication or abuse, (4) alteration, (5) lack of reasonable care or (6) wind, ice, snow, rain, lightning, power surges, or any other weather conditions or acts of God. Pico Macom's warranty with respect to third-party proprietary sub-assembly modules and/or private-label products are limited to the duration and terms of third-party vendors' warranty. Pico Macom shall in no event and under no circumstances be liable or responsible for any consequential, indirect, incidental, punitive, direct or special damages based upon breach of warranty, breach of contract, negligence, strict tort liability or otherwise or any other legal theory, arising directly or indirectly from the sale, use, installation or failure of any product acquired by buyer from Pico Macom. This limited warranty extends to the original purchaser. Pico Macom reserves the right to modify or discontinue this warranty at Pico Macom's sole discretion without notification. No other warranties are expressed or implied.

Uptime Loaner Program

Our Uptime loaner program is designed to provide domestic users of our headend products and commercial systems the best possible support and service. This program is established to minimize downtime resulting from equipment failure in critical service situations. We offer this program free-of-charge (excluding freight) to qualified purchasers within the warranty period. The program provides a free equipment loan of like qualified equipment enabling seamless operation for the time required to repair and return the unit.

The process is simple. Call our Customer Service desk requesting a return-merchandise-authorization (RMA) number for the failed equipment and ask for a loaner unit. We will issue an invoice for the List Price of the loaner unit plus shipping costs. When you receive the loaner unit, pack the failed unit in the loaner unit's box and ship it freight prepaid to Pico Macom for repair. When you receive the repaired unit, a new RMA number will be provided in the box. Carefully pack the loaner unit and affix the new RMA number on the box and ship it back to us for full credit excluding shipping costs.

To qualify for the program, you must have current open-terms with us and in good standing. We must receive your failed unit within one week after the loaner unit is shipped to you, and must likewise receive the loaner unit within one week after the repaired unit is shipped back to you. Daily rental fees not to exceed 10% of the equipment's List Price will apply beyond one week after the loaner or repaired unit are shipped to you. Other limitations may apply, so please call us for additional information on qualifying equipment and procedures. Pico Macom reserves the right to modify or discontinue the Uptime Loaner Program at any time, and at its sole discretion.

Damage or Shortage Claims

Our shipping staff carefully packs and ships your orders in compliance with common carriers' requirements. Please make note of any obvious damage or shortage on the freight bill or carrier's receipt next to your signature. The carrier's agent must too sign acknowledging the loss. Failure to do so may result in the carrier's refusal to honor the claim. Please open your order immediately upon receipt to check for concealed damage and compare the packing list to the items shipped. If damaged, keep the original shipping cartons for possible inspection by the carrier. You must report claims for loss or damage within 3 days of delivery, while claims for erroneous charges or price corrections must be presented within 30 days of invoice date.

Returning Shipped Items

To return any shipped items, including those shipped for warranty repairs or credit, call our Customer Service desk to request a Return Merchandise Authorization (RMA) number. Please reference the original invoice number and purchase date, and product serial number (if any). Be certain to mark the RMA number on the package boldly and legibly. Unless we specify a different carrier, please ship your returned items to us via UPS freight prepaid and fully insured. If returned for credit, we will promptly process your request upon receipt of your return order.

Our Return Policy: Your Satisfaction Guaranteed

Our goal is your complete satisfaction. If for any reason, our products were not quite what you anticipated, simply call your customer service rep and we will be happy to assist you in replacing or returning the order. You may return current, non-discontinued items for full credit for up to 30 days from invoice date. Our requirements are simple: Excepting defective items, the products must be returned in their original packaging and in re-salable condition. Restocking fees may otherwise apply beyond this period or if products are not returned in their original condition. Please contact your customer service rep for more information.

