

Product Manual

QCA9-33 Active Combiner

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Overview



The Contemporary Research QCA9-33 is an active RF combiner that features eight high-level inputs and one low-level input, combining with high isolation, and amplifying up to a 33 dBmV output level. Designed for QMOD HDTV applications, the eight RF inputs typically receive 29 dBmV RF from QMOD HDTV modulators. The ninth input is for up to 19 dBmV RF signals, such as incoming cable feed, a control channel from an ICE- HE Head End control modulator, or another QMOD or QCA9-33. The extremely low-noise wideband 860 MHz amplifier compensates for combining losses and adds 3 dBmV of gain, typically supplying a total output of up to 33 dBmV.

The compact QCA9-33 mounts two-across in a single rack space using CR RK1 and RK-2 rack kits, and can be mixed with QMOD HDTV modulators using the same rack kits. The units are wholly designed and manufactured in the USA.

Features

- Combines 8 high-level inputs and one low-level input
- Compensates for combining losses and adds 3 dBmV gain
- Provides a maximum output level of up to 33 dBmV
- Low power, draws less than 2 watts
- Compact metal enclosure, mounts 2 across in 1 RU using RK1 and RK2 rack kits

Applications

- Combine 9 inputs to drive a medium-sized RF system
- 9 QMOD Modulators
- 8 QMOD Modulators plus ICE-HE Head End
- 8 QMOD Modulators plus cable feed
- Feed output to a second CCA9-33 to combine up to 17 channels
- Feed 8 QCA9-33 units to one QCA9-33 to combine 64 or more channels without signal loss
- Feed combined output to a launch amplifier for larger systems

Specifications



Physical	8.5" [216mm] wide x 1.75" [38mm] height (1RU) x 6.0" [153mm] deep 1.5 lbs [0.68kg] Durable metal enclosure, rack mountable
Back Panel	8 Input F Connectors 1 Low-level Input F connector 1 Amp Out F connector DC Power input Power LED
Inputs	8 High-level Inputs - Max input 30 dBmV 1 Low-level Input - Max input 19 dBmV
Isolation	38 dB typical, 30 dB minimum, 54 - 860 MHz
Return Loss	30 dB typical
Output	17 dBmV amplifier, extremely low noise, linear performance through 860 MHz
Net Level	Net + 3 db gain after combining
Max Level	Maximum level +33 dBmV
CTB	Composite Triple Beat -75 dBc, 132 channels at +30 dBmV per channel
Noise	Noise Figure 1.8 typical
Return loss	20 dB typical
Power	2.1mm coaxial jack (inside center conductor positive), 170 mA maximum, 11.5 to 15 VDC, 12 VDC typical (may be unregulated)
Includes	PS12-500 12 VDC, 500 mA power supply
Options	RK1 Rack Kit for single unit, 1 RU RK2 Rack Kit for dual units, 1 RU

Installation

Basic Setup



The QCA9-33 is designed for QMOD applications, but can be used with other RF channels at similar levels

Connect High-Level Sources to Inputs 1-8

Feed the RF outputs from up to 8 QMOD HDTV Modulators, normally set to output 29 dBmV.

Connect to the low-level RF Input 9

The ninth low-level (15-19 dBmV) port adds several options. The QCA9-33 will amplify the input by 15.5 dB:

- Add an unplanned modulator – just set the QMOD to 17 dB.
- Make room for an ICE-HE Control Modulator. The best practice is:
 - Move a QMOD to Input 9, set to 17 dB
 - Add the ICE-HD RF Out to a high-level output; insert a 20 dB attenuator to reduce the HE output from about 52 dBmV to 32.
- Combine a cable feed, usually filtered to knock out cable channels.

RF Amp Out

The QCA9-33 accepts up to 30 dBmV level, and after compensating for combining losses, amplifies the input level by +3 dBmV – up to a maximum of +33 dBmV. This means the typical RF level from the QMOD 29 dBmV will be +32 dBmV.

The output level of the low-level input will be amplified by a net 13.5 dBmV. So a 17 dBmV input will be amplified to 30.5 dBmV.

16-Channel Operation

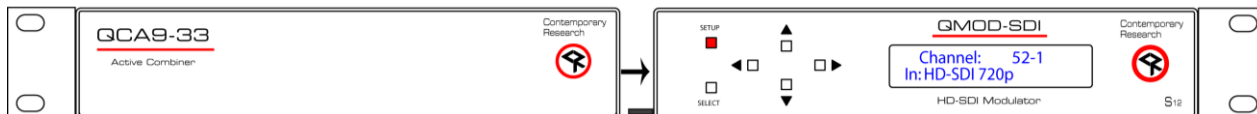
Typically, connect the RF Out from 2 QCA9-33 combiners to a 2-1 splitter. This will provide 16-channel operation, with a small loss of 3.5 dBmV.

16-64 Channel Operation

Feed the RF Out of up to 8 QCA9-33 to one QCA9-33. Set the QMOD HDTV Modulators to 25 dBmV. This will provide a +28 dBmV RF level from each QCA9-33 combiners, resulting in a total +31 dBmV from the final QCA9-33 combiner. Of course, and additional 8 QMODs could feed the low-level inputs, for a total of 72-73 channels.

Rack Mounting

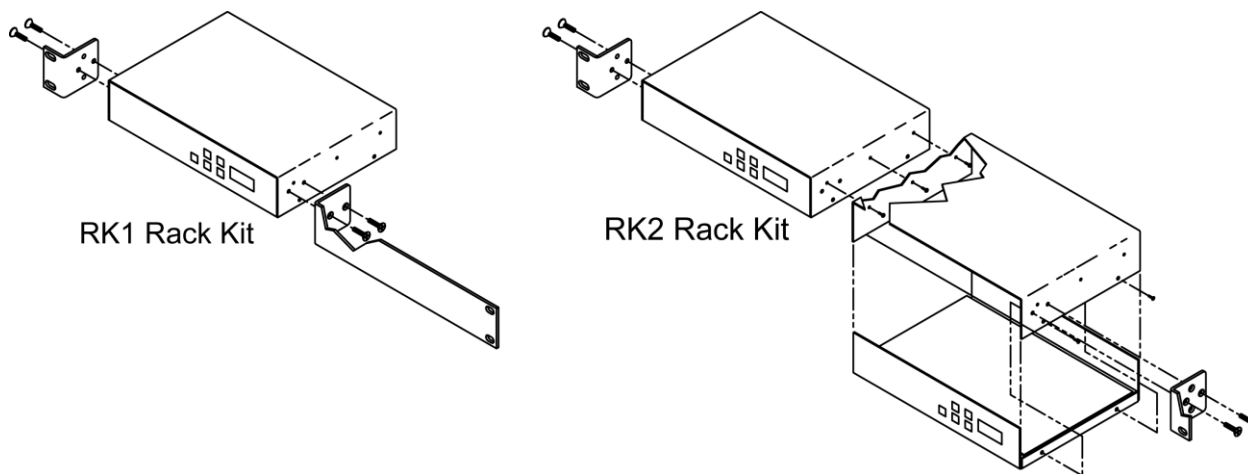
Three options are available for rack-mounting QCA9-33 Active Combiners and QMOD modulators.



RK2 Dual Rack Kit with Tie Bar Mounting

New QMOD and QCA enclosures have a slot in the bottom middle of the case. This will accept a tie bar that will lock the two enclosures together without taking the cases apart

1. Check that your enclosures have the tie bar slot.
2. Slide the included tie bar into the side of one unit and attach with the included screws.
3. Slide the other unit into the tie bar, and attach the screws
4. Add the rack mounts to the sides.



RK1 Single Unit Rack Mount

Attach the long and short rack ears to the side and towards the front of the unit with the four (4) supplied 8-32 by 1/4" (black) countersunk screws.

RK2 – Locking Cases together

1. Remove top cover of the first unit by removing the ten (10) black screws.
2. Attach cover of first unit to the side of the second with three (3) supplied 4-40 by 1/4" (silver colored) panhead screws and split lock washers. Note that only one side of the second unit has the (3) built in nuts to accept the screws above.
3. Reinstall the bottom/chassis of the first unit underneath its cover and attach with just eight (8) of the screws removed in step 1.
4. Attach short rack ears to the side and towards the front of each unit with the four (4) supplied 8-32 by 1/4" (black) countersunk screws.

Safety Instructions

Read before operating equipment.

1. **Cleaning** - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
2. **Power Sources** - Use supplied or equivalent UL/CSA approved low voltage DC plug-in transformer.
3. **Outdoor Antenna Grounding** - If you connect an outside antenna or cable system to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
4. **Lightning** - Avoid installation or reconfiguration of wiring during lightning activity.
5. **Power Lines** - Do not locate an outside antenna system near overhead power lines or other electric light or power circuits or where it can fall into such power lines or circuits. When installing an outside antenna system, refrain from touching such power lines or circuits, as contact with them might be fatal.
6. **Overloading** - Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
7. **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, resulting in a fire or electric shock. Never spill liquid of any kind on the product.
8. **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.
9. **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 spills or objects fall into the product.
 - If the product is exposed to rain or water.
 - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. An improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
 - If the video product is dropped or the cabinet is damaged.
 - When the video product exhibits a distinct change in performance, this indicates a need for service.

Limited Warranty and Disclaimer

Contemporary Research Corporation (CR) warrants this product to be free from defects in material and workmanship under normal use for a period of two years from the date of purchase from CR. Should such a defect occur CR will repair or replace, at their option, the defective product at no cost for parts or labor.

This warranty extends to product purchased directly from CR or an Authorized CR Dealer. Consumers should inquire from selling dealer as to the nature and extent of the dealer's warranty, if any.

All warranty claims must be shipped pre-paid to the factory. Call or fax to obtain a Return Material Authorization (RMA) number.

CR is not liable for any damages caused by any of its products or for the failure of any products to perform, including any lost profits, lost savings, incidental damages, or consequential damages. CR is not responsible for any claim made by a third party or made for you by a third party. This limitation of liability applies whether damages are sought, or a claim is made, under this warranty or as a tort claim (including negligence and strict product liability), a contract claim, or any other claim. This limitation of liability cannot be waived or amended by any person. This limitation of liability will be effective even if CR or an authorized representative of CR has been advised of the possibility of any such damages.

Some states do not allow a limitation of how long an implied warranty lasts. Some states do not allow the limitation or exclusion of incidental or consequential damages for consumer products. In such states, the limitation or exclusion of the Limited Warranty may not apply to you. This Limited Warranty gives you specific legal rights. You may also have other rights that may vary from state to state. You are advised to consult applicable state laws for a full determination of your rights.

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