



# Masterclock DA12 RF and Pulse Dual Channel Amplifier User Manual

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## Masterclock DA12 RF and Pulse Dual Channel Amplifier



The DA12 is a distribution amplifier. It amplifies and isolates time code signals, RF and electronic pulses to a dozen leads. The DA12 is an Ideal hub for clock systems distributed over large areas and distances.

Thank you for your purchase of a DA12 Time Code, RF and pulse dual channel distribution amplifier from

## **Masterclock**

Here you'll find instructions for unpacking and installing your distribution amplifier, proper care and configuration. We are here to help.

You can reach us using various contact methods (phone, email, etc.) found at our website:

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

Before calling, please attempt to find the answer to your situation here. You'll find this user manual will handle virtually all of your questions.

## **DISCLAIMER**

The information contained in this document is subject to change without notice. Masterclock®, Inc. (hereinafter Masterclock) makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Masterclock shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material. See important limited warranty information starting.

## **OPERATING ENVIRONMENT**

The DA12 is not water- or moisture-proof. Treat it as you would any other delicate electronic device and do not expose it to water, condensing humidity, excessive heat or physical abuse.

## **Introduction**

The DA12 is a dual channel distribution amplifier for SMPTE, EBU, IRIG and other time codes (TC). Inputs are provided through BNC connections. The unit provides inputs for single-ended, balanced and unbalanced time code.

## **Installation**

Simply install the DA12 into your rack mount setup. The unit uses AC power. Connect your inputs and outputs using BNC cables.

## **Initial Operation**

Setup for initial operation consists of:

- Supplying a source of time code
- Connecting a power source
- Adjusting the gain of individual channels
- Configuring the output switch (located on back)
- Connecting to one or more time code reader devices

## **SUPPLYING A TIME CODE SOURCE**

A source of time code is required. This may be in the form of electronic pulse, radio frequency, DC IRIG Time Code or AM IRIG Time Code (TC). TC is an audio signal similar to that of a modem. It can be routed over unshielded wire, like flat telephone cable, or over an RG-58/59 coaxial cable.

Connect the Time Code source to the input BNC connector or the appropriate pins on the rear of the DA12. The input has an impedance of 50 to 600 ohms.

## **CONNECTING A POWER SOURCE**

Apply power by inserting the AC cord into an appropriate AC power source. The input range of the DA12 is 0 to 25 Vp-p for SMPTE and IRIG TC.

## **ADJUSTING THE GAIN OF INDIVIDUAL CHANNELS**

The output range of the DA12 is adjustable from 0 to 12dB into a 600 ohm load. Each output channel bank is adjustable via the gain controls on the back of the unit.

The two gain adjustments screws (in blue and inset on the back panel) modify the gain of their respective sets of outputs.

Turning the gain adjustment clockwise increases the gain on the appropriate channel. Turning it counterclockwise decreases the gain. The units are shipped for unity gain with 2VP-P SMPTE TC.

### CONFIGURING THE OUTPUT SWITCHES

There is one switch on the back of the DA12 and two gain adjustments which require a flat head screwdriver.



The Select switch will allow you to output channel A with a single input across all 12 outputs, or use channels A and B with their respective inputs and outputs independently.

Channels A and B have independent gain adjustments located adjacent to their respective inputs.

### ACCESS TO PC BOARD

There are no adjustable components accessible inside the unit. Do not attempt to open the case.

### NORMAL OPERATION

When power is applied the front panel LED will light.

### OPERATING ENVIRONMENT

The DA12 is not water- or moisture-proof. Treat it as you would any other delicate electronic device and do not expose it to water, condensing humidity, excessive heat or physical abuse.

### Problems – Troubleshooting

All DA12 units are checked for proper operation before shipment and unless physical damage is found, the unit is probably functional. If you have problems in getting the unit to work:

- Double check all input and output connections
- Make sure that power is applied and the front panel LED is on
- verify that a valid TC is connected
- verify that the TC (Time Code) input level is adequate
- verify that the TC output level is correct for the device being fed

If the unit does not work even after the above precautions have been noted, please contact the factory (page 10).

## DA 12 Specs



- 2 inputs: 1/12 or 2/6 input/output, all BNC connectors
- Dual isolated output banks
- Standard chassis color is black powder coat
- Universal worldwide AC power
- CE marked for sale in EU –FCC, class B, emissions (pending)
- Green power LED on front panel

The DA12 comes with rack mount “ears.”

### INPUTS – 2

- **RF**
  - Frequency 0 Hz – 20 MHz
  - Level 1 V rms [15 dBm max]
  - Impedance 50  $\Omega$  or 600  $\Omega$
  - Isolation A to B >85 dB

Pulse /DC IRIG Time Code	
Frequency	1PPS to 10 MPPS
Level	0-7V p-p
Duty Cycle	0 to 100%
Impedance	50 $\Omega$ or 600 $\Omega$

### • AM IRIG Time Code

- Frequency 1 PPS to 10 MPPS
- Level 0-6 V p-p
- Modulation Frequency Up to 1 MHz
- Code Format Any IRIG format, IEEE 1344, NASA 36, 2137, XR3
- Impedance 50  $\Omega$  or 600  $\Omega$

## OUTPUTS – 12

### • RF

- Frequency 0 Hz – 20 MHz
- Level 1 V rms [15 dBm max]
- Gain 0 dB to 12 dB trimmable
- Harmonic <-40 dBc
- Non-harmonic <-80 dBc
- Load Impedance 50  $\Omega$

<b>Pulse /DC IRIG Time Code</b>	
Frequency	1PPS to 10 MPPS
Duty Cycle	0 to 100%
Rise Time	< 20 ns
Fall Time	< 20 ns
Skew	< +2 ns
Load Impedance	50 $\Omega$

### • AM IRIG Time Code

- Frequency 1 PPS to 10 MPPS
- Modulation Frequency Up to 1 MHz
- Code Format Any IRIG format, IEEE 1344, NASA 36, 2137, XR3
- Load Impedance 50  $\Omega$

## Limited Warranty

This Masterclock product warranty extends to the original purchaser.

Masterclock warrants this DA12 against defects in materials and workmanship for a period of 5 years from the date of sale. If Masterclock receives notice of such defects during the warranty period, Masterclock will, at its option, either repair or replace products that prove to be defective.

Should Masterclock be unable to repair or replace the product within a reasonable amount of time, the customer's alternate remedy shall be a refund of the purchase price upon return of the product to Masterclock. This warranty gives the customer specific legal rights. Other rights, which vary from state to state or province to province, may be available.

## EXCLUSIONS

The above warranty shall not apply to defects resulting from improper or inadequate maintenance by the customer, customer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product or improper site preparation and maintenance (if applicable).

## WARRANTY LIMITATIONS

MASTERCLOCK MAKES NO OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THIS PRODUCT. MASTERCLOCK SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

In any state or province which does not allow the foregoing disclaimer, any implied warranty of merchantability or fitness for a particular purpose imposed by law in those states or provinces is limited to the five-year duration of the written warranty.

### **EXCLUSIVE REMEDIES**

THE REMEDIES PROVIDED HEREIN ARE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MASTERCLOCK BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY. In any state or province that does not allow the foregoing exclusion or limitation of incidental or consequential damages, the customer may have other remedies.

### **HARDWARE SERVICE**

You may return your DA12 to Masterclock for repair service. Please contact the factory for RETURN AUTHORIZATION before returning the unit. When you return your DA12 for service, you must prepay all shipping charges, duty, and taxes. For international returns, please contact the factory.

### **Declaration of Conformity**

DoC#: DA12-201206  
Masterclock, Inc.  
2484 West Clay St. Saint Charles, MO 63301

Time Code, RF & Pulse Amplifier  
DA12  
is compliant with the CE directives and standards listed below.

#### **Directives:**

- Electromagnetic Compatibility (2004/108/EC)
- Low Voltage Directive (2006/95/EC)

#### **Standards:**

- CENELEC EN 55022:2010 Class B CENELEC EN 55024:2010 Immunity
- IEC 61000-4-2:2008
- IEC 61000 4-3:2006 +A1:2007, +A2:2010
- IEC 61000 4-4:2004 +A1:2010
- IEC 61000-4-5:2005
- IEC 61000-4-6:2008
- IEC 61000-4-11:2004
- CENELEC EN 61000-3-2:2006/A1:2008/A2:2009 Harmonic Current IEC 61000 3-2:2005 +A1:2008 +A2:2009
- CENELEC EN 61000-3-3:2008 Voltage Fluctuations IEC 61000-3-3:2008
- CENELEC EN 60950-1:2006 +A11:2009

### **Contact Us**

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## Documents / Resources

	<p><a href="#">Masterclock DA12 RF and Pulse Dual Channel Amplifier</a> [pdf] User Manual DA12, DA12 RF and Pulse Dual Channel Amplifier, DA12 RF, and Pulse Dual Channel Amplifier, Pulse Dual Channel Amplifier, Channel Amplifier, Amplifier</p>
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## References

- [Masterclock® | Advanced Timing & Frequency Solutions](#)
- [User Manual](#)

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