

**TCA100**

**SMPTE/EBU/IRIG TIME CODE**

**AMPLIFIER**



## TABLE OF CONTENTS

DISCLAIMER .....	1
INITIAL OPERATION .....	1
Time Code Source .....	1
Time Code Interconnect Cable .....	1
Input Connections.....	1
Time Code Input Level.....	1
Time Code Output Level .....	1
Power Supply .....	1
Power Supply Voltage.....	1
Battery Operation .....	1
Setup and I/O Options .....	1
Pin Jumpers and DB-9 Output Connector Details.....	2
PC Board Layout.....	2
Jumpers J4 & J5 .....	2
Jumper J6.....	2
Normal operation.....	3
Gain Adjustment.....	3
Operating Environment .....	3
Access to PC Board .....	3
PROBLEMS - TROUBLE SHOOTING .....	4
SPECIFICATIONS.....	4
Input .....	4
Output.....	4
Power Supply Requirements .....	4
Physical .....	4
Operating Temperature.....	4
OPTIONS.....	5
Rack Mount – RM4 .....	5
LIMITED WARRANTY & SERVICE .....	6
Exclusions .....	6
Warranty Limitations .....	6
Exclusive Remedies.....	6
Hardware Service .....	6

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## **INTRODUCTION**

The TCA100 is a dual channel distribution amplifier for SMPTE, EBU, IRIG and other time code (TC) . Inputs are provided through either DB-9 or BNC connections. The unit provides inputs for both balanced and unbalanced time code. Differential, single ended or floating balanced outputs are provided through female BNCs and male DB-9.

## **INITIAL OPERATION**

Setup for initial operation consists of :

- supplying a source of time code
- connecting a power source
- adjusting the gain of individual channels
- installing jumpers on header pins (located inside the case) for the desired output
- connecting to a time code reader device

### **Time Code Source**

A source of either time code is required.

### **Time Code Interconnect Cable**

TC is an audio signal similar to that of a Modem. It can be routed over unshielded wire like a telephone or, if desired, over a RG-58/59 coaxial cable.

### **Input Connections**

Connect the TC to the Input BNC connector or the appropriate pins on the DB-9 on the rear of the TCA100. The input is balanced, isolated from chassis ground and has an input impedance of > 100K ohm.

### **Time Code Input Level**

The input range of the TCA100 is 0.75 to 14 V<sub>p-p</sub> for SMPTE and IRIG TC.

### **Time Code Output Level**

The output range of the TCA-100 is adjustable from 1 to 14 V<sub>p-p</sub> into a 600 ohm load. Each output channel is individually adjustable via the gain controls on the front of the unit.

### **Power Supply**

Apply power by inserting the PS module into an appropriate AC power source and the power connector into the socket on the rear of the unit.

### **Power Supply Voltage**

The TCA100 requires a nominal power supply voltage of 12 VDC. Power consumption is approximately 0.5 watt.

### **Battery Operation**

If desired the unit can be operated from a nominal 12 VDC power source (9-28 VDC range). Observe voltage polarity - printed on the rear panel.

### **Setup and I/O Options**

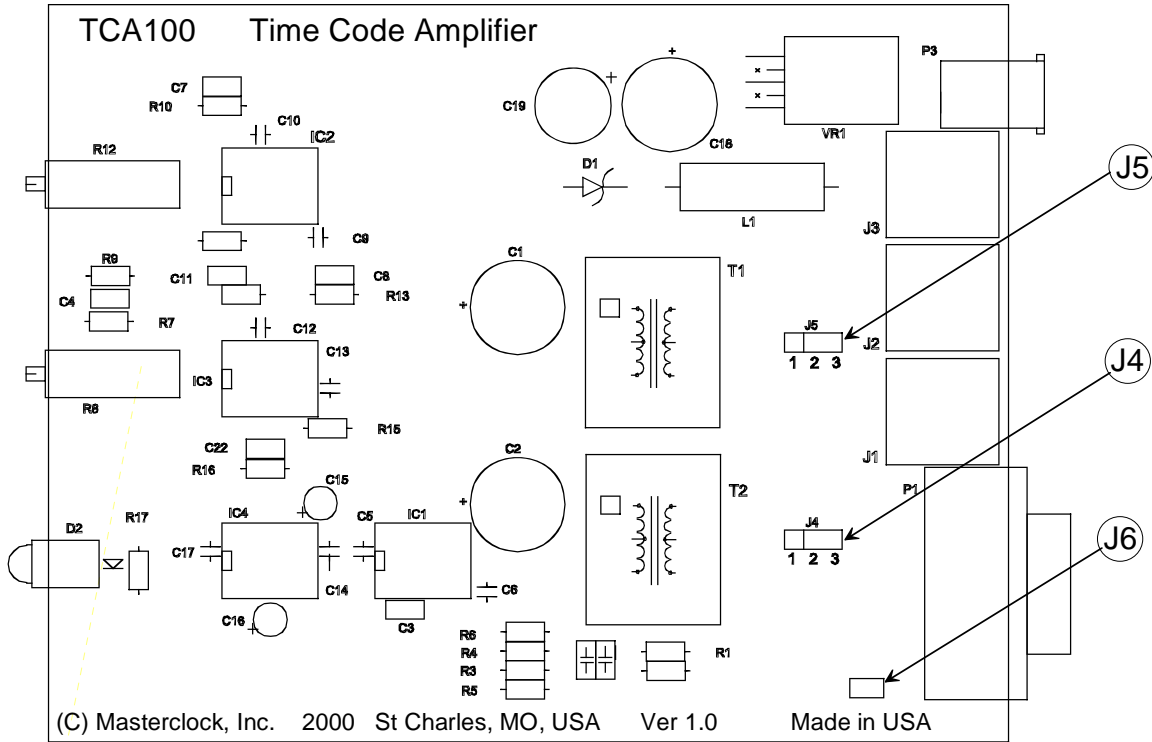
Several output parameters can be configured by setting pin jumpers inside the case. See the section "Access to PC Board".

# PIN JUMPERS AND DB-9 OUTPUT CONNECTOR DETAILS

Figure 1 shows the location of the jumpers on the PC board.

## PC Board Layout

Figure 1



### Jumpers J4 & J5

- Pins 1&2 closed - Differential output
- Pins 2 & 3 closed – Single ended output
- No jumper – Floating balanced output

### Jumper J6

- Pins closed – Input BNC shield Grounded

I/O is routed simultaneously to Channel 1 and Channel 2 BNC connectors and pins on the DB-9 connector. To simultaneously use some combination of DB-9 I/O, a custom I/O cable would be necessary. Such cables can be fabricated locally by a competent electronic technician or, on a custom basis, by Masterclock.

Input/Output wiring details for the DB-9 output connector are shown on Figure 2 - Simplified I/O Schematic.

DB-9	
Function	Pin
Input +	1
Input -	6
Ground	2
Channel 1 +	7
Channel 1 -	3
Ground	8
Channel 2 +	9
Channel 2 -	4
Ground	5

Simplified I/O Schematic

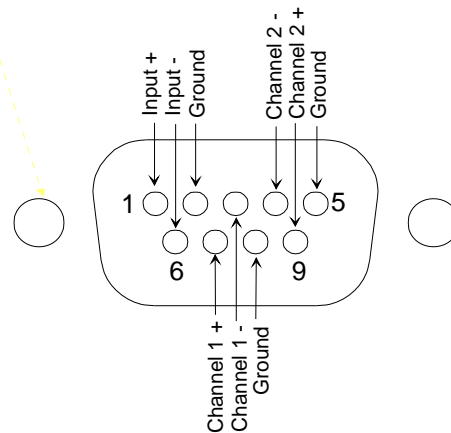


Figure 2

### Normal operation

When power is applied the front panel LED will light.

### Gain Adjustment

Each channel can be adjusted individually from the front panel gain controls. Using a small, flat blade screwdriver turn the the appropriate channel gain adjustment. 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 2V<sub>P-P</sub> SMPTE TC.

### **OPERATING ENVIRONMENT**

The TCA100 is not water or moisture proof. Treat it as you would any other delicate electronic device and do not expose it to water, excessive heat or physical abuse.

### **ACCESS TO PC BOARD**

In order to gain access to the pin jumpers it is necessary to remove the case from the TCA100 as follows: First disconnect the power and other cables from the unit. Even though the highest voltage inside the TCA100 is 12 VDC (which is generally not dangerous to touch), accidentally shorting a trace or wire inside the unit with power on could destroy or damage any one of the extremely sensitive electronic components. **Accidentally shorting a wire or trace or subjecting the unit to a static discharge, even for a very small fraction of a second, can destroy these components. Such damage is not covered by the warranty.**

Remove the two Phillips screws on the rear panel (this is the end with the power socket. Holding the case of the unit in one hand, slide the rear panel assembly outward from the rear. The entire rear panel assembly and PC board will slide out.

Do not touch the PC board with any external wiring and, whenever possible, handle the unit by the rear panel or on the edge of the PC board as you would a Compact Disk. When not changing the jumpers or switches, always keep the PC board installed in the case.

When reassembling the unit take care that the PC board is properly fitted into the slots in the base of the chassis. When properly inserted, the PC board and rear panel assembly will slide easily into the case, no force is necessary. The warranty does not cover damage caused to the unit while removing or reassembling the PC board.

## **PROBLEMS - TROUBLE SHOOTING**

All TCA100 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 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.

## **SPECIFICATIONS**

### **INPUT**

Format: ..... SMPTE, EBU & IRIG  
Level:..... Up to 14 V<sub>P-P</sub>  
Impedance: ..... > 100K ohm  
Connector: ..... BNC and DB-9

### **OUTPUT**

Format: ..... follows input  
Level:..... adjustable from 1 to 14 V<sub>P-P</sub>  
Impedance: ..... 600 ohm  
Connector: ..... BNC and DB-9

### **POWER SUPPLY REQUIREMENTS**

Input voltage..... 12 VDC (9-28 VDC)  
Input power connector..... 2.1mm male  
Power consumption - @ 12V..... 40 ma (480 mW)

### **PHYSICAL**

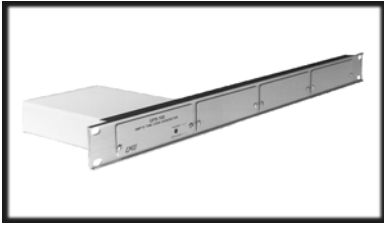
Size:..... 1.5 x 4.1 x 5.5 in. (3.8 x 10.4 x  
14 cm)  
Weight..... 17 oz. (480 gr.)

### **OPERATING TEMPERATURE**

Temperature..... 0 to +70 °

## OPTIONS

### **RACK MOUNT – RM4**



The RM-4 is a standard 19” wide, 1RU kit for mounting up to four Masterclock stand-alone units.

## **LIMITED WARRANTY & SERVICE**

This (Masterclock, Inc.) product warranty extends to the original purchaser.

Masterclock warrants the TCA100 against defects in materials and workmanship for a period of one year from date of sale. If Masterclock receives notice of such defects during the warranty period, Masterclock will, at its option, either repair or replace products which 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 one-year duration of the written warranty.

### **EXCLUSIVE REMEDIES**

***THE REMEDIES PROVIDED HEREIN ARE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL C&A 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 which 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 TCA100 to Masterclock for repair service. Please contact the factory for return authorization before returning the unit. When you return your TCA100 for service, you must prepay all shipping charges, duty, and taxes.

For international returns, please contact the factory.