TCC500

TIME CODE to PARALLEL BCD

INTERFACE

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See important limited warranty information starting on page 2.

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INTRODUCTION

The TCC500 is a SMPTE or IRIG-B time code decoder that can synchronize time on any device that can accept parallel BCD time input. The TCC500 features include:

- SMPTE (30, 25, and 24 frames/second) and IRIG-B(1) (modulated) and IRIG-B (unmodulated) time code decoding
- Automatic time code level gain control
- Optional "time valid" signal
- Optional negative logic BCD time output

CONFIGURATION

The TCC500 is configured for operation via a 4 switch DIP labeled SW1 located on the PC board inside the enclosure. To access the switch, remove the screws from the rear of the TCC500 and then grasp the rear panel of the assembly to remove the PC board from the case.

A SW1 switch in the OFF or OPEN position indicates an option is OFF.

Use SW1-1 to configure the TCC500 to decode the desired time code type.

SW1-1 OFF (default)   - SMPTE time code decoding (automatic detect)
SW1-1 ON   - IRIG-B time code decoding

Use SW1-2 to configure the TCC500 to activate a "time valid" signal when time is valid on the DB-37 parallel BCD time output. A high signal indicates "time valid". The "time valid" signal is available on pin 19 on the DB-37.

SW1-2 OFF (default)   - "Time Valid" signal disabled
SW1-2 ON   - "Time Valid" signal enabled

Use SW1-3 to configure the TCC500 to invert all BCD time data bits on the parallel output.

SW1-3 OFF (default)   - Normal parallel BCD time output
SW1-3 ON   - Inverted parallel BCD time output

Use SW1-4 to configure the TCC500 to decode the desired type of IRIG time code.

SW1-4 OFF (default)   - IRIG-B (1) (modulated) time code decoding
SW1-4 ON   - IRIG-B (unmodulated) time code decoding

INSTALLATION

POWER SUPPLY

Apply power by inserting the PS module into an appropriate AC power source and the power connector into the male socket on the rear of the unit. The TCC500 requires a nominal power supply voltage of 12 VDC. Power consumption is approximately 2.5 watts.

INPUT CONNECTIONS

Connect TC to the BNC connector on the rear of the TCC500. The input has an input impedance of >10K ohm. Signal levels between -20dB and +20dB (600 Ohm) are accepted by the TCC500, which will automatically calibrate to incoming time code signal level.

TIME CODE OUTPUT

The male DB-37 connector on the rear of the TCC500 provides parallel BCD time output. A standard 1:1 pin matched cable, not exceeding 25 feet in length, may be used to connect the TCC500 to any device that can accept parallel BCD time input. See Appendix A forpinout description of the TCC500.

OPERATION

On power up the TCC500 will turn the front-panel LED steady-on. When time code is first applied, the unit will internally calibrate itself to the time code signal level. This may take from 10 to 60 seconds. After achieving a stable calibration, the unit will start sending the BCD time code out on the DB-37 port. This indicates valid time code signal is being received.

Time update frequency

The TCC500 will update the BCD time on the parallel output as follows:
- SMPTE   – once per frame
- IRIG-B   – once per millisecond

Consult Appendix B - Troubleshooting if the TCC500 is not synchronizing to the time code as expected.

HARDWARE SERVICE

You may return your TCC500 to Masterclock for repair service. Please contact the factory or consult the website (http://www.masterclock.com/rma.htm) for return authorization instructions before returning the unit. When you return your TCC500 for service, you must prepay all shipping charges, duty, and taxes. Except for products returned by the customer from another country, Masterclock will pay for return shipment of products to the customer.

APPENDIX A – TCC500 PINOUTS

Pin	TCC500 Description		Description
1			
2	Hour Tens (1)	20	Hour Tens (2)
3	Hour Units (4)	21	Hour Units (8)
4	Hour Units (1)	22	Hour Units (2)
5	Minute Tens (4)	23	Ground
6	Minute Tens (1)	24	Minute Tens (2)
7	Minute Units (4)	25	Minute Units (8)
8	Minute Units (1)	26	Minute Units (2)
9	Second Tens (4)	27	Ground
10	Second Tens (1)	28	Second Tens (2)
11	Second Units (4)	29	Second Units (8)
12	Second Units (1)	30	Second Units (2)
13	Millisecond Hundreds (8)	31	Ground
14	Millisecond Hundreds (2)	32	Millisecond Hundreds (4
15	Millisecond Tens (8)	33	Millisecond Hundreds (1)
16	Millisecond Tens (2)	34	Millisecond Tens (4)
17	Millisecond Units (8)	35	Millisecond Tens (1)
18	Millisecond Units (2)	36	Millisecond Units (4)
19	"Time Valid" Signal	37	Millisecond Units (1)

APPENDIX B - TROUBLESHOOTING

If the following troubleshooting steps do not solve a problem you are experiencing, contact Masterclock technical support.

Problem #1:   I have applied time code to the TCC500 but the BCD time code output is not being generated.

The TCC500 does not recognize valid time code.

- Allow at least 60 seconds for the TCC500 to calibrate itself to incoming time code.
- Verify that time code signal level is between -20dB and +20dB. The TCC500 cannot process signal levels outside this range.
- Verify that cable connecting the TCC500 to time code source is a good cable.
- Verify that a ground loop does not exist between TCC500 and time code source.
- Verify that the time code source is generating time code.
- Verify that TCC500 is configured for the time code type desired (SW1-1).

Problem #2:   My parallel BCD device is not being synchronized by the TCC500.

- If the TCC500 front-panel LED is not steady-on jump to *Problem #1*.
- Verify that there exists a 1:1 pin-matched connection between the TCC500 and the device connector. The connection between the two devices should be as described in Appendix A.
- Verify that all 37 pins in the cable used to connect the two devices are actually connected and that the cable is not in excess of 25 feet in length.
- Verify that a ground loop does not exist between the TCC500 and the device.

- Your device may require a "time valid" signal to accept time synchronization. Set SW1-2 in the ON/CLOSED position to see if unit accepts synchronization.
- Your device may require inverted BCD inputs to accept time synchronization. Set SW1-3 in the ON/CLOSED position to see if unit accepts synchronization.

Problem #3:   My parallel BCD device is synchronized with bizarre or otherwise incorrect time information.

- Your device may require a "time valid" signal to accept time synchronization. Set SW1-2 in the ON/CLOSED position to see if the problem is resolved.
- Your device may require inverted BCD inputs to accept time synchronization. Set SW1-3 in the ON/CLOSED position to see if the problem is resolved.
- Your time code source may not be providing time information encoded to the time zone you expect. Confirm the time zone offset encoding with the individual or group responsible for in-house time code distribution. The TCC500 cannot offset time code for the purpose of time zone adjustments. Masterclock provides other products that can be used in conjunction with the TCC500 to accomplish this requirement.

SPECIFICATIONS

INPUT

Format:..SMPTE - 24 - 25 or 30 fps or IRIG-B (modulated and unmodulated) time code
Level: ....Range -20dB and +20dB (0 db/600 Ω) automatic level set
Impedance:..> 10 K ohm
Connector: ....BNC

OUTPUT

Format:..Parallel BCD
Level: ....TTL (5 VDC)
Impedance:.. High
Connector: DB-37

OUTPUT ACCURACY

Latency from incoming TC............< 100 μ sec

POWER SUPPLY REQUIREMENTS

Input voltage....................................12 VDC
Input power connector..................2 mm male
Power consumption - @ 12V   approximately 200 ma (2.4 W)

PHYSICAL

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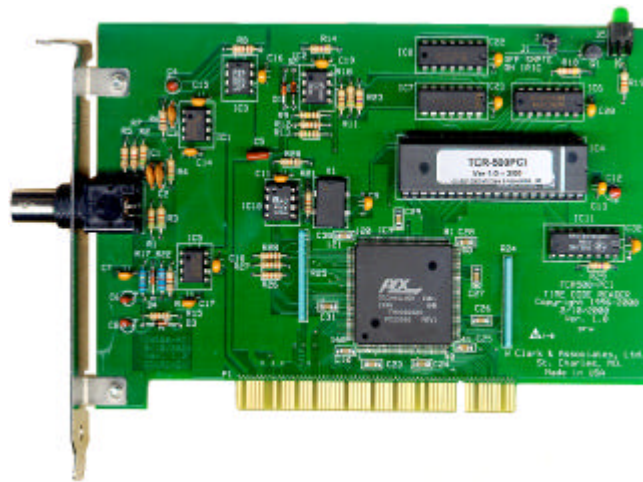
OPERATING TEMPERATURE

Temperature   0 to +70° C

OPTIONS

RACK MOUNT (RM-4) WITH 4 MASTERCLOCK PRODUCTS INSTALLED

TIME CODE READER CARD - TCR-500

MASTER CLOCK GENERATOR GPS-200 (FRONT & REAR VIEW)