

Timecode Reader/Generator

Model TPRO-VME



- IRIG-A, IRIG-B, NASA36, XR3, and 2137 timecode reader
- Multifunctional timecode reader/generator
- Time-Tag input
- Two configurable pulse rate outputs
- 1 MHz TTL output
- Freewheel capability
- Continuous parallel time output

The TPRO-VME performs timing and synchronization functions referenced to an input timecode signal. The board synchronizes its on-board clock to the incoming timecode, providing it as an IRIG-B output. Other features include a time-tag TTL input, a 1 MHz TTL output, and two user-configurable TTL pulse rate outputs.

The board continues to increment time ("freewheel") in the absence of an input timecode, serving as an IRG-B generator once the clock is set over the bus.

The input timecode format is detected automatically and input synchronization is also automatic. A propagation delay offset can be specified to compensate for cable delays.

The front panel includes status indicators.

The board's peak input amplitude ranges from 0.5 Vp-p to 8.0 Vp-p. The timecode input is differential and not referenced to ground. A single-ended input (referenced to ground) is also acceptable.

VME Interface

The board supports A32, A24, and A16 addressing modes using the standard address modifiers. Custom modifications for additional modifiers are also available.

All board functions can be generated when time is available or when a time-tag event has occurred. The interrupt level (IRQ1-IRQ7) is selected by jumpers. Interrupts may be disabled and the status registered polled. Customized periodic interrupts are also available.

Per VME specifications, users may define rows A and C of the P2 backplane connector. The on-board clock time is output as 54 TTL signals, providing continuous time with zero latency. To prevent conflict with other user-specific boards, order Option "-32P2" to eliminate these outputs.



Specifications

Timecode Input

Code Format (Autodetect): IRIG-A (A132), IRIG-B (B122), NASA36, 2137, XR3

Amplitude: 2.6 V_{p-p}

Polarity: Detected automatically

Modulation Ratio: 2:1 min, 3:1 typ, 4:1 max

Input Impedance: >10K Ohms

Input Time Accuracy:

Better than 100 ppm (not suitable for tape playback)

Common Mode Voltage:

Differential input, ±200 V max

Timecode Output

Code Format: IRIG-B (B122)

Amplitude (Adjustable): 2.6 V_{p-p} typical (0-6 V_{p-p} mark adjustable)

Modulation Ratio (Adjustable): 3:1

Output Impedance: 600 Ohms

On-Board Clock

Resolution: 1 μS

Range: 366:23:59:59:999999

Date Format: Integer (001-366)

Propagation Delay Correction:

-1000 μS through +8999 μS (1 μS resolution)

Propagation Delay Setting:

Programmed over bus

Synchronization Time: <20 seconds

Stability:

Disciplined to timecode: 2×10^{-7}

Undisciplined: 1×10^{-6}

Time-Tag Input

Input Voltage:

-0.5 V min, +0.8 V max for logic 0

+2.0 V min, +5.5 V max for logic 1

Tags rising edge

Input Current:

<-1.2 mA for logic 0

<0.5 mA for logic 1

Rise/Fall Time: 500 nS max

Repetition Rate:

1000 events per second maximum

Timing Resolution: 1 μS

Parallel Time Outputs

(not present if ordered with Option -32P2)

Output Voltage:

Logic 1: 2.4 V min at 15 mA max

Logic 0: 0.5 V max at 2.7 mA max

Stroke: 1 MHz squarewave

Format:

BCD, 54-bit, days through microseconds

Rate Outputs 1 and 2

Pulse Rates:

1 PPS, 5 PPS, 10 PPS, 20 PPS, 100 PPS

1 KPPS, 10 KPPS, 50 KPPS, 100 KPPS

Output Voltage:

Logic 1: 2.4 V min at 800 mA max

Logic 0: 0.4 V max at 16 mA max

Pulse Width: 1.5 mS positive, typical

Timing: Rising edge on-time

1 MHz Output

Output Voltage

High: 3.8 V min at 4.0 mA

Low: 0.3 V max at 5.0 V mA

Duty Cycle

45% min, 50% typ, 55% max

Timing

Rising edge on-time

Bus Interface

Addressing Modes:

A32 with address modifiers 09 or 0D

A24 with address modifiers 39 or 3D

A16 with address modifiers 29 or 2D

Data Modes:

All functions accessible with D08 (O)

(D07-D00)

D16 supported with D15 D08 unused.

Time can also be read as two D32 long words.

Access Needed:

2 (read time, 32-bit mode)

14 (read time, 8-bit mode)

12 (read time-tag, set time)

Interrupts:

IRQ1-IRQ7 (jumper selected)(all functions can be used without interrupts, if desired)

Interrupt Controller: MC68153

General

Size: H 261.8 mm, L 172.2 mm, D 22.6 mm

Power (from bus):

+5 Vdc @ 1.5 Amps max

+12 Vdc @ 150 mA max

-12 Vdc @ 200 mA max

Operating Temperature:

0° to +50° C (32° to +122° F)

Storage Temperature:

-40° to +60° C (-40° to +140° F)

Drivers

Major operating systems are supported.

Ordering Information

Model TPRO-VME (+option #)

Options

-32P2: Connector option eliminates 54-bit output on VME P2 connector

-MX5: 2PPS reference input

-MJ5: 2 PPS input on J5 connector

-50L: 50Hz output

-APL1: Timecode input and time tag input to back plane