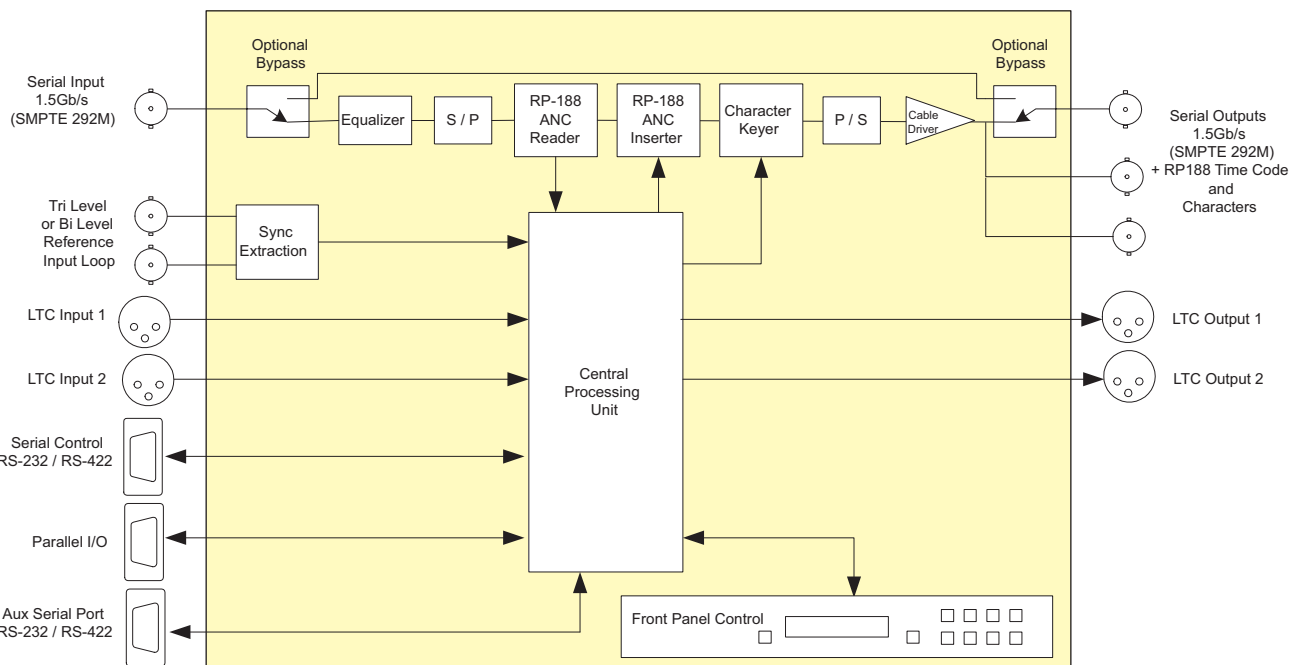The HD9010TM HDTV Time Code Master is a full function time code reader/generator system for high definition serial digital video. The HD9010TM is a combination dual generator/dual reader for Linear Time Code (LTC) and SMPTE 12M-2 Ancillary Time Code (ATC), and contains a high resolution character inserter which can burn the generator or reader numbers directly into the serial digital program output.

The HD9010TM will accept SMPTE 292M (1.5Gb/s) high definition serial digital video. The HD9010TM's time code generators can be preset to lock to the input video or to an analog bi-level or tri-level sync signal. When generating 24Fps timecode it will also lock to a 6Hz pulse.

The HD9010TM generators can be slaved to incoming LTC or ATC or can be set to free run. The generators may also be momentarily synchronized to one of the readers, and then continue to increment normally regardless of the reader code.

The second LTC output normally follows the primary output, however the two generators can be operated at different frame rates to supply both 24Fps and 30Fps time code when used in a 1080p/24 environment. The drop frame conversion mode allows you to generate Drop Frame code on 1080i/59.94 broadcast master tapes when adding 3:2 pulldown to 1080p/23.98sF source material.

The high-resolution character inserter provides independently positionable windows to show time and user bits for the generator and readers simultaneously. One character size and the choice of white or black characters with or without contrasting background mask are available.

▶ Features & Benefits

- Video formats supported: 1080i/60, 1080i/50, 1080p/30, 1080p/30sF, 1080p/25sF, 1080p/24sF, 1035i/60, 720p/60, 720p/50 and the 1/1.001 divisor versions where applicable
- Reads SMPTE 12M-2 LTC and VITC ancillary time code (ATC) from incoming video - read line auto detected
- Generates SMPTE 12M-2 LTC and VITC ancillary time code on output video
- Two LTC readers and two LTC generators operate at 24, 25 or 30Fps nominal rate in accordance with SMPTE 12M specification
- Generates 24Fps and 30Fps simultaneously
- SMPTE 12M-2ATC ⇔ LTC translator
- Genlocks to NTSC/PAL color black or HD Tri-level sync
- Locks to 6Hz pulse when generating 24Fps nominal rate code
- Drop frame ⇔ Non drop frame converter

- Character windows for the reader and generator time and user bit data Windows can be positioned and turned off and on independently
- White or black characters on contrasting background
- Two characters sizes
- Front panel display and control using menu system
- Parallel GPI/O control of common functions
- GPI Remote Control mode allows user to pass remote control contact closure information in SMPTE 12M-2 user bits
- Field upgradeable firmware as new features become available
- Optional input relay bypass for power failure bypass protection
- Optional dual power supply configuration

▶ Specifications

Serial Video Input:

Standard:	SMPTE 292M (1.5Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/60, 1080i/50, 1080p/30, 1080p/30sF, 1080p/25sF, 1080p/24sF, 1035i/60, 720p/60, 720p/50, and the 1/1.001 divisor versions where applicable software selectable or autodetect
Connector:	BNC per IEC 61169-8 Annex A
Input Equalization:	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable (50m with +HBP option)
Return Loss:	> 15dB up to 1GHz
	> 10dB up to 1.5GHz (with +HBP option)

Serial Video Output:

Number of Outputs:	1 relay bypassed (with +HBP option) 2 non bypassed
Connectors:	BNC per IEC 61169-8 Annex A
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	< 10% of amplitude
Jitter:	< 0.2 UI
Timecode:	SMPTE 12M-2 Auxillary timecode

LTC Generators:

Standard:	SMPTE 12M-1
Number:	2
Frame Rate:	24, 25 and 30Fps nominal
Connectors:	3-pin male XLR type connector
Level:	Adjustable, 0.5V to 4.5V p-p
Rise Time:	40 ±10µs
Jitter:	< 2µs

LTC Readers:

Standard:	SMPTE 12M-1
Number:	2
Frame Rate:	24, 25 and 30Fps nominal
Connectors:	3-pin female XLR type connector
Level:	0.2 to 4V p-p, balanced or unbalanced
Speed:	1/30th to 50x play speed, VTR dependent

Video Reference:

Type:	Menu selectable - depends on video format NTSC or PAL Color Black 1V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300mV HD Tri-level sync SMPTE 292M (1.5Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/60, 1080i/50, 1080p/30sF, 1080p/25sF,1080p/24sF, 1035i/60, 720p/60, 720p/50, and the 1/1.001 divisor versions where applicable software selectable or autodetect
Connectors:	2 BNC per IEC 61169-8 Annex A
Termination:	High impedance loop through

General Purpose In/Out:

Number:	6 programmable input or output functions
Type:	Active low with internal pull-ups to +5V
Connector:	Female High Density DB-9
Signal Level:	+5V nominal

Serial Remote Control:

Standard:	RS-232, selectable baud rate
Number of ports:	2
Connector:	9-pin female "D"
Control:	Firmware upgrade, timecode data broadcast

Physical:

Dimensions:	19" W x 1.75" H x 18.75" D (483mm W x 45mm H x 477mm D)
Weight:	8lbs (3.5kg)

Electrical:

Power:	Auto ranging 100 to 240V AC 50/60Hz 40W
Safety:	TüV listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

▶ Ordering Information

HD9010TM	HD Time Code Generator/Reader

Ordering Options

+HBP	Bypass Relay Protection
+2PS	Redundant Power Supply