

## FEATURES

- **RECORDS UNCOMPRESSED SDI VIDEO TO VOLATILE & NON-VOLATILE MEMORIES**
  - Continuously to removable SSD (1TB, non-volatile) up to 150K Frames 1080p/60 Uncompressed
  - DDR3 (volatile) event/Loop up to 5.8K Frames 1080p/60 Uncompressed
  - Save more than 30 event clips to SSD
  - Live monitor video while recording
- **INSERTS**
  - **Metadata**
    - MISB 0605.3 compliant timestamp
    - 2 KLV metadata blocks of user formatted data in VANC space
  - Text & crosshairs, bore site graphics
- **PLAYBACK SDI OR VIDEO DATA DOWNLOAD**
  - Delivers uncompressed SDI video at 1/32x to 32x or 1-frame stepping from DDR3 or SSD
  - Downloads raw uncompressed video data from SSD to a file via Ethernet
  - Decodes, Overlays, Extracts Metadata
    - Overlays none, some or all user defined fields in each metadata key
    - Extracts data in KLV to data file frame x frame with/without timestamps
- **CLEAN DDR3 (VOLATILE) OR SSD (NON-VOLATILE) COMPLIANT WITH DOD 5220.22-M**
- **ACCEPTS SD, HD SDI SMPTE 259M/292M/424M SDI VIDEO SOURCES**
- **CAMERA SYNC (OPTIONAL); GPS/IRIG PHASE LOCKED; ADJUSTABLE OFFSET**
  - TTL DATA SOURCE STROBE; GPS/IRIG PHASE LOCKED; ADJUSTABLE OFFSET
- **DISCIPLINED STRATUM 3 FREE RUN CLOCK (OPTIONAL); < 5μSEC/HR UNLOCKED DRIFT**
- **CONTROL VIA WEB SERVER OVER ETHERNET, REMOTE PANEL OR WITH ROBUST COMMAND SET**
- **DISCRETE, WEBSERVER, GUI AND COMMAND EVENT TRIGGER INPUTS**




## DESCRIPTION

The Model 6520 is a rugged SDI video Inserter-Recorder (I-R) that captures and plays **uncompressed** SDI video. Source video may be, 720p or 1080p at 25, 30, and 60 frames/sec and 480i/60 1080i/60 (also at the NTSC comparable rates). It will detect these SDI inputs and synchronize to them automatically. The SDI video source may be monitored live while recording with less than 8μsec of in-out latency. The unit records all HANC (AES audio and other metadata) and VANC metadata. The I-R can overlay text and crosshairs (fixed and movable) while recording or during playback. More importantly, the 6520 can insert VANC KLV metadata including the MISB Microsecond Timestamp. All timestamps are accurate to within 4μsec of the selected time reference (GPS or IRIG). The user may design a custom metadata KLV key using **ITS KLV SOFTWARE TOOLKIT**<sup>1</sup> currently delivered with our HD-SDI video products. When metadata is recorded, the 6520 may be commanded during playback to decode and overlay metadata as well as extract and send it out as a data record per frame stream. There are three modes of recording possible; Event Record (ER) to DDR3 (volatile), ER to DDR3 and save event clips to the removable SSD (non-volatile) or Continuous Record (CR) to the removable SSD<sup>2</sup>. All of these modes capture UNCOMPRESSED SDI video at the native resolution and frame rate received. When in ER mode, the recorder will continuously record to DDR3 the number of frames set by the user (up to 60,000) in a loop. When an event is triggered, the 6520 will stop recording after the number of post-frames set by the user has been captured. The clip data may be played back from the DDR3 as SDI to the output video port or saved to SSD as a clip. The 6520 I-R can also continuously record to the removable SSD to the full 1TB capacity (e.g. 41 minutes of 1080p/60). During any playback, the video may be stopped, played back 1 frame at a time or from slow motion 1/32xFR to 1xFR in 32 steps or at 2xFR to 32xFR either forward or reverse. Download of clips saved to SSD may also be accomplished resulting in a raw video data file (uncompressed). All or part of a clip may be downloaded via Ethernet. ITS offers the **DownloadVideo**® (6520 DLK) software package that can not only download clips remotely from SSD, but process them into pure 4:2:2 10-bit sample data unmodified from what was delivered by the camera. DownloadVideo® offers the ability to transcode raw video to WMV, AVI or MP4 formats. Clips saved to SSD may be any mix of input formats. The Camera Sync option adds tri-level sync (TLS) that may be programmed or auto synchronized to match the camera format. TLS is phase locked to the chosen reference. It may be delayed in 1μsec steps enabling synchronization of picture taking across a variety of imaging technologies. Supporting data collection time coherent to imagery, the camera sync option also provides a TTL strobe output that may be adjusted relative to the TLS ±16ms in 1μ steps. A built in SSD clean function will perform DOD 5220.22-M method C; then method H when directed.

<sup>1</sup> See the Application Note on our website for more information.

<sup>2</sup> SSD modes require the optional SSD function and port.

## SPECIFICATIONS

<b>Video In</b>	SMPTE standard SD/HD/HD-3G SDI digital video. Formats supported and auto-detected:		
	SD	480i at 29.97 Hz, <i>Metadata is not supported w/SD</i> (SMPTE 259M video)	
	HD	720p and 1080p at 60, 59.94, 30, 29.97, 25 Hz, 1080i at 30 and 29.97 Hz; 1080p/60 SMPTE 424M (3G)	
<b>Video Out</b>	SDI identical to video input or recorded except with graphics, annotation, and metadata as added.		
<b>Event Record</b>	Video Format	Frames/time (DDR3 Volatile Memory)	
		<b>16 GB Event Record</b>	<b>32 GB Event Record</b>
	480i	13,000F/ >7 min	26,000F/ >14 min
	720p/60	5,000F/>83 sec	10,000/ >2 min
	1080p/30	2,500F/>83 sec	5,000F/>2 min
	1080/60	2,500F/>41 sec	5,000F/>83 sec
	Loop length is programmable from 10 frames to capacity. Two loops may be configured to support a rapid sequence of events. History before trigger (frames), 1 to loop length -1; Post trigger recording from trigger to loop length		
<b>SSD (option)</b>	Record Clips to removable SSD (Event clips); Event clip capacity depends on loop length and frame capacity of SSD. May play back as uncompressed SDI or download the raw video data of a clip or partial clip to directly via Ethernet		
	Continuous Record to removable SSD; capacity depends on media. Currently 1,000 GB capacities are available.		
	Record Times w/ 1TB SSD	480i/60, >801,000 frames; >445 minutes 720p/60, >300,000 frames; >83 minutes 1080p/30, >150,000 frames; >82 minutes 1080p/60, >150,000 frames; >41 minutes	
<b>Memory Cleaning</b>	per DOD 5220.22-M: <b>SSD</b> (NV) method C; then method H; <b>DDR3</b> (Volatile) method C (requires manual power down)		
<b>Playback</b>	Speeds 1/32 to 1x in 32 steps, 1x to 32x in 32 steps; forward or reverse, Rewind = start of clip.		
<b>Download to File</b>	Via Ethernet port (SSD clip data). Speed varies with format and Ethernet speed and traffic.		
<b>Time Overlay</b>	Resolution selectable from 1 sec to 1 µsec in 7 steps, 1.0, 0.1, 0.01, 0.001 seconds, 100, 10, 1 µsec		
<b>GPS Timing Accuracy</b>	When Locked After Fix	Drift from last synchronized time when NOT locked	
		After 24 hours of GPS lock	After >20 min of GPS lock w/S3 Option
	±300 ns RMS @ 1 sec ±30 ns RMS @ 100 sec	<540 µsec/hr <1300 µsec/day	< 5 µsec/hr < 40 µsec/8-hrs
<b>Position</b>	Inserts Latitude, Longitude. Position accuracy : five meters circular error probability (CEP)		
<b>GPS Performance</b>	12 channels, track all satellites in view; Time-to-first-fix <25 sec (warm start), <180 sec (cold start) Reacquisition < 3 sec		
<b>GPS Antenna</b>	Active Patch Magnetic Mount Antenna, 5 VDC via antenna cable. Antenna with 5-meter cable is included.		
<b>IRIG B Input</b>	IRIG B (IRIG Standard 200-04). Input level 500mv p-p to 5 v p-p w/ mod ratio of 2:1 to 3:1, Formats B120 - B127.		
<b>Metadata</b>	Metadata Timestamp is recorded in the vertical ancillary packets (VANC) of the SDI stream IAW MISB STD 0605.3 Up to 2 SMPTE 291M type 02 KLV packs w/user defined keys & content. Includes ITS KLV Software Toolkit (HD-SDI only)		
<b>Ethernet Port</b>	Standard TCP/IP protocol, 10/100/1000 Mbit/sec, user settable IP addressing. Control and download video data.		
<b>Remote Interface</b>	For optional remote control used to PLAY< or >, RECORD, REWIND, EVENT, Record to SSD, SAVE to SSD.		
<b>Alphanumeric Characters</b>	From 24 to 54 lines of characters depending on video input format and size selection. Number of characters per line is 20, 40, 60, 80 or 120 depending on the input format and size selection. Individual characters are 7X9 pixel matrix.		
<b>Camera Sync</b>	Option; Tri-level sync IAW SMPTE 296M (720p/1080i) and SMPTE 274M (1080p); TTL strobe on each vertical sync.		
<b>Package and Environment</b>	<b>Size</b>	3.5" H x 10.5" W (including mounting flanges) x 7.8" D ruggedized aluminum enclosure. 2U 19" Rack Mount version also available.	
	<b>Weight</b>	6/5.5. SM/RM (est.)	<b>Temp</b> Op -20°C to +50°/ Non-Op -40°C to +80° <b>Humidity</b> 85% non-condensing
<b>Power Input</b>	AC or DC power input may be specified; 12-36 VDC, or 115/240VAC 50/60 Hz <40 watts A universal power adapter, 6256-60, for 115/240 VAC 50/60 Hz is available to support the DC power input.		