

# Legaltek Monarch HDX Technical Specifications

<b>Inputs and Outputs</b>	
<b>Supported HDMI Video Input</b>	<p><u>Progressive</u> 1920x1080 @ 60/59.94/50/30/29.97/25/24/23.98 Frames per second 1280x720 @ 60/59.94/50 Frames per second</p> <p><u>Interlaced</u> 1920x1080i 29.97/25 Frames per second</p>
<b>HDMI Video Output</b>	<p>Preview output of video input signal. Preview output is available when source SDI or HDMI.</p> <p><i>Note that when input is an SDI resolution, the HDMI preview output will show video windowboxed on an HD output.</i></p>
<b>Supported SDI Video Input</b>	<p><u>Progressive</u> 1920x1080 @ 60/59.94/50/30/29.97/25/24/23.98 Frames per second 1280x720 @ 60/59.94/50 Frames per second</p> <p><u>Interlaced</u> 1920x1080i @ 29.97/25 Frames per second 720x486i @ 29.97 Frames per second 720x576i @ 25 Frames per second</p> <p><u>Compliant with SMPTE 259M/292M/424M (Level A) / 425M</u></p>
<b>SDI Video Output</b>	<p>0 frame latency passthrough of Input signal. Output is a clean distribution of SDI incoming signal. Hardware bypass relay present in SDI signal path is "closed" on power failure.</p>
<b>Audio Input</b>	<p>Processes the first two channels of audio embedded in HDMI or SDI input signals. Unbalanced analog stereo input via 1/8" (3.5mm) jack. Line Level</p>
<b>Audio Output</b>	<p>Passthrough of 8 channel of embedded audio channels in HDMI and SDI signals. Unbalanced analog stereo output via 1/8" (3.5mm) jack—passthrough of input. Line Level</p> <p><i>Note that all outputs are active regardless of audio and video input selection.</i></p>
<b>Extra features</b>	<p>Video Input Format is Auto-Detected in SDI and HDMI.</p>

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<b>Frame Synchronization</b>	
<b>Frame Synchronization</b>	The Monarch HDX contains frame synchronization circuitry designed to compensate for disruptions of the input signal. This circuitry is in place for both SDI and HDMI inputs. Streaming and recording operations will proceed cleanly with repeated or dropped frames.
<b>H.264/MPEG-4 Part 10 (AVC) Video Encoder</b>	
<b>Resolutions</b>	Selectable encoding resolutions ranging from: 128x128 to 1920x1080
<b>Bit Rates Ranges</b>	Single Encoder - Streaming mode: 20 Mbps Single Encoder - Recording mode: 30 Mbps Dual Encoder - Maximum of 10 Mbps for streaming channels Maximum of 30 Mbps combined for both channels
<b>Encode Frame Rates</b>	Encode frame rates selection includes; 60/50, 30/25/24 and 15/12.5.  Single Encoder – Maximum of 1080p60 fps Dual Encoder – Maximum of 720p60 fps or 1080p30 fps
<b>Encoding Profiles</b>	Baseline, Main and High
<b>Encoding Controls</b>	2.0, 3.0, 3.1, 4.0, 4.1 Level Support GOP Size Variable bit rate support Average max/min data rate controls Deblocking Filter
<b>MPEG-4 AAC Audio Encoder</b>	
<b>Standard</b>	AAC-LC
<b>Sample Frequency</b>	32, 44.1 and 48 kHz when digitized from an analog source
<b>Channels</b>	2 channels Stereo (L/R)
<b>Bit Rates</b>	Range from 32 kbps to 256 kbps  <i>Note that audio codec settings are applied to both encoders.</i>
<b>Scaler</b>	
	High Quality multi-tap 10 bit Down Scaler and De-Interlacer Available to both streaming and recording operations
<b>H.264 Input preview Stream</b>	
<b>Resolution</b>	320x180
<b>Average Bitrate</b>	100-300 kbps
<b>Stream Type</b>	RTSP

	<i>Note the preview encoder is automatically disabled when primary encoder resolution are at the max to ensure best streaming and/recording performance.</i>
<b>Recording File Format</b>	
<b>File Type</b>	Industry Standard MP4 and MOV files with two channels of embedded AAC audio
<b>Recording Lengths</b>	Maximum file length of 300 minutes—irrespective of storage type used. File splitting feature allows a user to record continuously for long periods by defining file segment sizes. The Monarch HDX will create these sequential file segments over the course of the recording operation without losing a single frame of video. File segment can have a length of 1 to 300 minutes.
<b>Network Interfaces</b>	
<b>Connector</b>	RJ45 providing 10/100/1000 Base-T Ethernet with Static or DHCP addressing
<b>Protocols</b>	RTMP, RTSP/RTP IPv4 Support Unicast and Multi Unicast (number of clients may vary from 3 to 10)
<b>User Interface</b>	
<b>Computer Based control</b>	HTTP via standard PC or Mac web browser using Monarch HDX Command Center.
<b>Physical Interface</b>	On Device push buttons for independent streaming and recording with Start/Stop control
<b>Storage Types for File Recording</b>	
<b>2 x USB 2.0</b>	Support for NTFS (3.1) and FAT32 file system <i>The Monarch HDX will support writing to USB3 devices at USB2 speeds. Also note, there is a very high variability in the performance capabilities of “thumb” drives (even USB3 versions). Many are optimized for “read” operations while the Monarch HDX requires sustained “write” capabilities. For best results, Matrox recommends using powered USB drives. If small portable media is required, SD cards may be more suitable.</i>
<b>1 x SD card Slot</b>	Supports SD and SDHC cards. Only NTFS formatted SDXC cards are supported. (Class 10 highly recommended).
<b>Network Mapped Drive</b>	Support for writing to shared folders in computers found on a network using Windows Share protocols (suitable for Windows system) as well as NFS protocols (suitable for Mac and Linux systems).

<b>Matrox Monarch HDX Command Center Web UI</b>	
<b>Start Stop Controls</b>	These buttons are available at all times no matter where you navigate in the UI.
<b>Status Page</b>	Provides relevant operational information concerning Status of Monarch HDX unit at that time including; Input video detection and resolution, State and configuration of Streaming operation, State and configuration of Recording operation, Error conditions, etc.
<b>Control Page</b>	Multiple Monarch devices can be connected in a Master/Slave topology to allow for synchronized recording and streaming operations across multiple units via a single interface.
<b>Record Settings</b>	Configuration of recording parameters set within this page. A number of presets are included which are selected based on post event use of the recorded asset. If file is to be uploaded for VOD purposes, a YouTube preset may be selected. If content is to be edited for high quality production, a higher bitrate preset may be preferable.
<b>Streaming Settings</b>	Configuration of Streaming parameters performed on this page. The RTMP or RTSP credentials as well as encoding parameters are entered. Encoder presets have been included to quickly select an ideal encoder settings based on desired delivery resolution or bitrate. The loading of Flash Media Server XML configuration files is supported.
<b>Administrative tools</b>	Device Naming, IP configuration, Date/Time settings and a variety of other tasks performed via this page.
<b>Additional Tools</b>	Matrox provides PC or Mac based utilities to help detect the Monarch HDX Device on a particular Network (DHCP server required), to update Monarch HDX devices with latest firmware and to reboot the devcies remotely.
<b>Physical</b>	
<b>Dimensions</b>	Length (shell) - 5.6" (14.2cm), Length (shell +BNCs) - 6" (15.3cm), Width - 8.5" (21.6 cm), Height (shell) - 1.4"(3.6cm), Height (Shell + pads) - 1.5" (3.81cm)
<b>Weight</b>	1.3 lbs, 0.6 kg
<b>Operating conditions</b>	32 to 104 deg. F (0 to 40 deg. C), 20 to 80% relative humidity (non-condensing)
<b>Power</b>	Input: 9-24 volts Connector: Din4 Total Power Consumption: 20-30 watts (42 max)
<b>Power Supply</b>	Line Voltage: 100-240 VAC

	<p>Frequency: 50-60 Hz  Input: External AC/DC adapter - IEC320-C8  DIN4 Locking Power Connector</p>
<b>Transport and Storage</b>	<p>Max Operating Altitude: 3000 meters  Max Transport altitude: 12,000 meters  Storage Humidity 5 to 95% relative humidity (non-condensing)</p>
<b>Regulatory</b>	<p>EMI: FCC Class A, CE Mark Class A, ACMA C-Tick Mark, VCCI  Power-supply Safety : UL/CUL(UL60950-1), TUV-GS(EN60950-1), T-LICENSE(BS EN60950-1), CCC(GB4943.1-2011), PSE(J60950), SAA(AS/NZS60950-1), KC-MARK(K60950), S-MARK(IEC60950-1)  RoHS Directive 2002/95/EC</p>
<b>Warranty</b>	<p>2 years with free telephone support</p>