

# MAGEWELL

## Pro Capture AIO Technical Specification

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### Supported OS

- Windows 7/8/8.1/10/2008/2008 R2/2012 (x86 & x64)
- Linux (V4L2 kernel driver source code under NDA, supports x86, x64 & arm architecture)

### Supported APIs

- Windows
  - DirectShow
  - DirectKS
  - Wave API/DirectSound/WASAPI
- Linux
  - V4L2
  - ALSA

### Supported Software

- VLC
- VirtualDub
- OBS
- XSplit
- vMix
- VidBlaster
- Wirecast
- Microsoft Media Encoder
- Adobe Flash Media Encoder
- Any other DirectShow/V4L2 encoding/streaming software

### Input Interfaces

- DV-H
  - DVI 1.0
  - HDMI 1.4a (via breakout cable)
  - VGA (via DVI2VGA connector)
  - Component (via breakout cable)
- DB9
  - YC (S-Video)

- Composite video
- Analog audio (L+R)
- Component video
- BNC
  - SD/HD/3G SDI

## Output Interfaces

- PCIe Gen2 x1

## Input Features

- Auto scan of video input sources when there is no signal input to the currently selected input source
- Manual selection of video input source
- Auto selection of linked (embedded) audio input source when the video input source changes
- Manual selection of audio input source
- Support for standard crossbar based on video input source selection
- Support for input video resolutions up to 2048x2160 pixels

## VGA & Component Specific Features

- 12-bit ADC
- Support for RGB & YCbCr (YUV) color formats
- Support for 'Separated sync', 'Composite sync', 'Sync-on-green' (SOG), 'Sync-on-luminance' (SOY)
- Support for DMT, CEA, CVT, GTF video timings
- Input signals up to 165MHz pixel rate are digitized with 1:1 sampling
- Input signals over 165MHz pixel rate can be digitized with horizontal sub-sampling (resulting in some image quality loss - NOT officially supported)
- Auto detection of RGB & YCbCr color formats
- Auto or manual sampling phase adjustment
- Auto horizontal alignment
- Support for customized video timings
- Support for customized video resolutions for CVT/GTF timings

## HDMI Specific Features

- 225MHz HDMI receiver
- Adaptive HDMI equalizer support for cables lengths up to 30M
- Support for customized EDID
- Support for extraction of AVI/Audio/SPD/MS/VS/ACP/ISRC1/ISRC2/Gamut InfoFrames
- Full colorimetry support
- Support for 8/10/12-bit color depths
- Support for RGB 4:4:4, YCbCr 4:4:4, YCbCr 4:2:2 color sampling
- Support for up to 8-channel IEC60958/IEC61937 audio streams
- Support for extraction of audio formation information & channel status data
- Support for extraction of video timing information
- Support for extraction of 3D format information
- Support for extraction of Sony/Canon DSLR time code
- Support for Side-by-Side Half, Top-and-Bottom, Frame Packing 3D mode.

## SDI Specific Features

- Integrated cable equalizer supporting cable lengths up to 230M for HD signals
- Support for SD/HD/3Ga/3Gb/3Ga-DL/3Gb-DS standards

- Support for 2K (2048x1080) mode
- Support for RGB 4:4:4, YCbCr 4:4:4, YCbCr 4:2:2 color sampling
- Support for 10/12-bit color depth
- Support for extraction of SMPTE 352 payload identifier
- Support for up to 8 (mono) audio channels at 48KHz (channels 1–8 from the 16 available in the SDI spec)
- Support for extraction of audio formation information & channel status data
- Limited support of 3Gb-DS: only the first stream can be captured
- Limited support for capture of the first link of dual link interfaces:
  - YCbCr 4:2:2 10-bit 1080p 50/59.94/60: captured as 1080i 50/59.94/60
  - YCbCr 4:4:4 10-bit: captured as 4:2:2
  - RGB 4:4:4: R/B sub-sampled

## YC & Composite Specific Features

- 12-bit ADC
- Support for NTSC, PAL and SECAM standards
- Auto detection of video input standard

## Video Output Formats

- Support for output image resolutions up to 2048x2160 pixels
- Support for output frame rates up to 144fps (Actual output frame rate can be limited by PCIe bandwidth, and at higher image resolutions - above 1280x1024 - by the pixel clock of the on-board video processing hardware. eg. Max frame rate at 1920x1080 = ~80fps. )
- Support for 4:2:0 8-bit output formats: NV12, I420, YV12
- Support for 4:2:2 8-bit output formats: YUY2, YUYV, UYVY
- Support for 4:4:4 8-bit output formats: V308, IYU2, V408, BGR24, BGR32
- Support for 4:4:4 10-bit output formats: V410, Y410
- More output formats are supported via Pro Capture SDK for DirectKS

## Video Processing Features

- Two video processing pipelines with ~180Mpixels/s processing bandwidth for each one
- Full 10-bit video processing
- Video cropping
- Video scaling
- Video de-interlacing
  - Wave
  - Blend top & bottom field
  - Top field only
  - Bottom field only
- Video aspect ratio conversion
  - Auto or manual selection of input aspect ratio
  - Auto or manual selection of output aspect ratio
  - Three aspect ratio conversion modes: Ignore (Anamorphic), Cropping or Padding (Letterbox or Pillarbox)
- Video color format conversion
  - Auto or manual selection of input color format & quantization range
  - Auto or manual selection of output color format, quantization range & saturation range
  - Support for RGB, YCbCr 601, YCbCr 709, YCbCr 2020 color formats
  - Support for Limited or Full quantization range
  - Support for Limited, Full & 'Extended gamut' saturation range
- Video frame rate conversion
- Video OSD composition

- Support for PNG OSD image (up to 2048x2160)
- Support for dynamic loading of RGBA OSD image via SDK

## Multiple Cards per System

- Support for multiple cards plugged to one system
- On-board rotary switch to set card number, with 16 positions from 0 to F
- System hardware device tree will display “01: Pro Capture AIO” when rotary switch is set to 1, and so on
- The video and audio device names displayed in your software will include the card number (set by the rotary switch)

## Multiple Output Streams

- Unlimited output streams for any one input channel
- Independent cropping, aspect ratio, color format, resolution, frame rate, de-interlacing and color adjustment settings for each individual stream

## Ultra Low Latency Support

- Latency of 64 video lines
- Partial notification mode in SDK

## Timestamp & A/V Synchronization

- Hardware based 100ns high resolution clock
- Audio frames (192 audio samples) & video frames are stamped with hardware clock
- Hardware clock can be synchronized across cards (via SDK)

## Video Output SG-DMA

- ~400MB/s per channel DMA bandwidth in PCIe 2.x system
- ~200MB/s per channel DMA bandwidth in PCIe 1.x system
- Support for auto detection of Intel tiled GPU surface
- Support for DirectGMA for AMD video adapter chipsets
- Support for GPUDirect for Nvidia video adapter chipsets

## SDK

- Pro Capture SDK for DirectShow for easy integration (Windows)
- Pro Capture SDK for DirectKS for maximum flexibility & performance (Windows)

## Windows Driver Tweaks

- All options can be controlled by three levels of registry key: global level, product level and device level
- Video, Audio, Crossbar filter names can be customized via registry keys

## Firmware Upgrade

- Multiple cards in one system can be upgraded simultaneously
- Cards can be upgraded without a system power shutdown (In most cases, even a reboot is not needed)

## LED Indicator

- Status LEDs indicate the working state of each channel: idle, input signal locked, memory failed or FPGA configuration failed.

## Form Factor

- Normal profile PCIe x1 Add-on Card
- 92.76mm x 96.24mm (without PCI bracket)

## Accessories

- **DVI2VGA** connector
- **DVI-I to HDMI + Component** breakout
- **DB9 to YC + Composite + Analog Audio + Component** breakout

## Power Consumption

- Max current at 12V ~0.4 A
- Max current at 3.3V ~0.3 A
- Max power consumption ~5.4 W

## Working Environment

- Operating temperature: 0 to 40 deg C
- Storage temperature: -20 to 70 deg C
- Relative Humidity: 5% to 90% non-condensing