12G-SDI 8K / 4K Frame Grabber

Capture 4K @ 60 fps over single-link or 8K @ 30 fps over dual-link 12G-SDI straight into your host PC or GPU. Install the card in any standard workstation or server, connect an SDI source and start ingesting uncompressed video with subframe capture latency and plug-and-play Linux drivers. The same card can loop the input out for monitoring and reference distribution, or play video back from the host to an SDI output. Built for performance-critical medical, broadcast and mission-focused video applications.

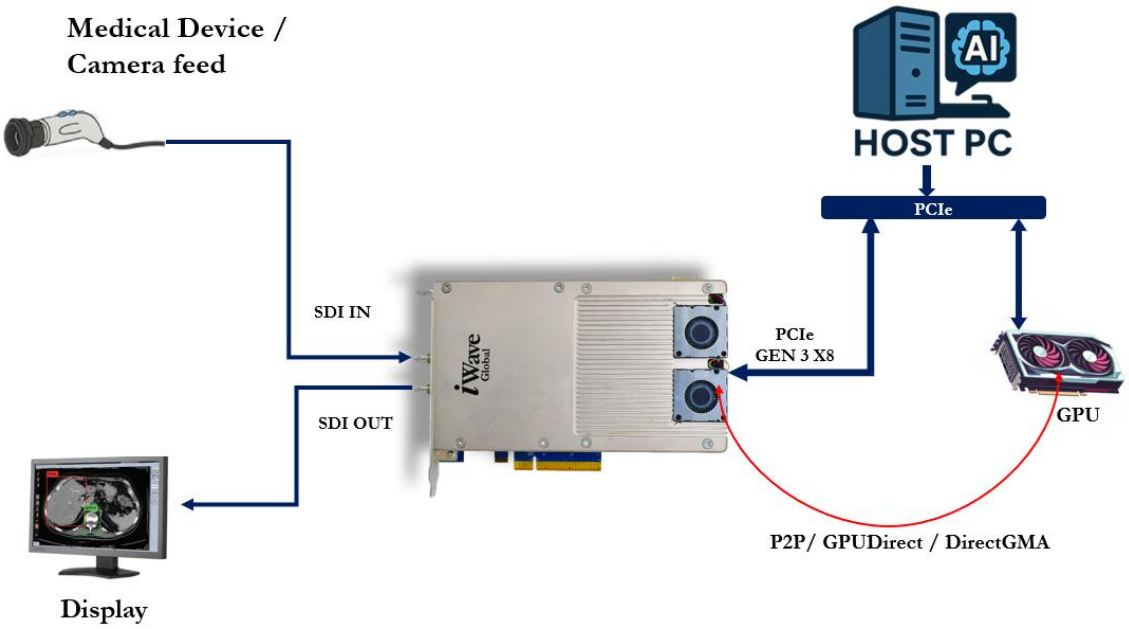


4K @ 60	8K @ 30	PCIe Gen3 x8	GPUDirect
single-link 12G-SDI	dual-link 12G-SDI	64 Gbps theoretical	and AMD DirectGMA

Highlights

- **Up to 4K @ 60 or 8K @ 30:** Single-link 12G-SDI up to 3840 x 2160 / 4096 x 2160 at 60 fps, or dual-link 7680 x 4320 at 30 fps, with SD, HD, 3G, 6G and 12G-SDI support.
- **Direct-to-GPU transfer:** NVIDIA GPUDirect and AMD DirectGMA write frames straight into GPU memory, freeing the host CPU for real-time AI and image processing.
- **Subframe capture latency:** Uncompressed capture to host memory over PCIe Gen3 x8 (64 Gbps theoretical)
- **Genlock and loop-out:** Genlock input for frame-accurate synchronization with the facility or camera reference, plus SDI loop-out for monitoring and multi-card systems.
- **Plug-and-play on Linux:** V4L2 driver with automatic video-node detection for GStreamer, FFmpeg, OpenCV, OBS Studio and VLC; also supports Windows.
- **FPGA video processing:** Colour-space conversion (YUV 4:2:2 / RGB / BGRA / BGRX) on the card, with custom FPGA processing and channel configurations on request.

Application Block Diagram



Technical Specifications

Video Interface	▪ 2 x 12G-SDI ports, configurable as 2 inputs, or 1 input 1 output. ▪ SD, HD, 3G, 6G and 12G-SDI: SMPTE ST 259, ST 292, ST 372, ST 424, ST 2081-1, ST 2082-1, ST 352 (payload ID) ▪ Up to 3840 x 2160 / 4096 x 2160 at 60 fps over single-link 12G-SDI ▪ 7680 x 4320 at 30 fps over dual-link 12G-SDI ▪ Pixel formats: RGB, BGRA, YUV 4:2:2. ▪ SDI loop-out for monitoring and reference distribution in multi-card systems; genlock supported for zero-latency loop-out ▪ Uncompressed video capture and playback
Host Interface	▪ PCIe Gen3 x8 with DMA engine, 64 Gbps theoretical link bandwidth ▪ On-board DDR memory with up to 192 Gbps bandwidth for frame buffering ▪ NVIDIA GPUDirect and AMD DirectGMA for direct transfer into GPU memory
Hardware Platform	▪ iWave AMD Zynq UltraScale+ ZU7EV MPSoC SOM with GTH transceivers ▪ Micro-SD slot, Micro-USB Type AB connector
Video Processing	▪ FPGA colour-space conversion between YUV 4:2:2 / RGB / BGRA / BGRX, ready for GPU keying, alpha blending and overlay

Video Processing	▪ Automatic detection of SDI resolution and frame rate ▪ On-board video test-pattern generator ▪ Custom FPGA processing and channel configurations on request
Software Features	▪ Linux V4L2 driver with automatic video-node detection ▪ Works with GStreamer, FFmpeg, OpenCV, OBS Studio and VLC; integrates with CUDA, OpenGL, Vulkan and DirectX pipelines ▪ Capture and recording from the card to the host PC ▪ Playback: video streaming from the host PC to the 12G-SDI output
Measured Performance	▪ Subframe latency from SDI input to host/GPU memory up to 4K @ 60 Hz ▪ Sustained streaming at 4K60 with no dropped frames on Host/GPU
OS Support	Linux and Windows
Power & Cooling	12V PCIe slot power | Active cooling
Form Factor	Full height (111.15 mm) x half length (167.65 mm) PCIe card (FHHL)
Operating Temperature	−40°C to +70°C
Environmental	ROHS compliant

Supported Capture Modes (summary)

Format	Max frame rate	Link	Pixel formats
4K UHD / DCI (3840 or 4096 x 2160)	60 fps	Single-link 12G-SDI	RGB, BGRA, YUV 4:2:2
8K (7680 x 4320)	30 fps	Dual-link 12G-SDI	RGB, BGRA, YUV 4:2:2
SD / HD / 3G / 6G	Auto-detected	Single-link	RGB, BGRA, YUV 4:2:2

Applications

- **Medical & surgical imaging**

  Capture endoscope and camera video at 4K for review, recording and real-time AI such as polyp segmentation.

- **AI vision & analytics**

  Deliver frames straight to GPU memory for low-latency inference and image processing.

- **Broadcast & live production**

  Ingest and play back uncompressed SDI, with genlock for frame-accurate synchronization.

- **Custom video pipelines**

  Add FPGA processing, channel configurations or form-factor changes through iWave custom design.

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Beyond our robust product ecosystem, we provide comprehensive ODM support with specialized custom design and manufacturing capabilities, enabling customers to accelerate and optimize their product development roadmaps. With a strategic focus on industrial, automotive, medical, and avionics markets, we deliver innovative technology solutions to global clients.

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