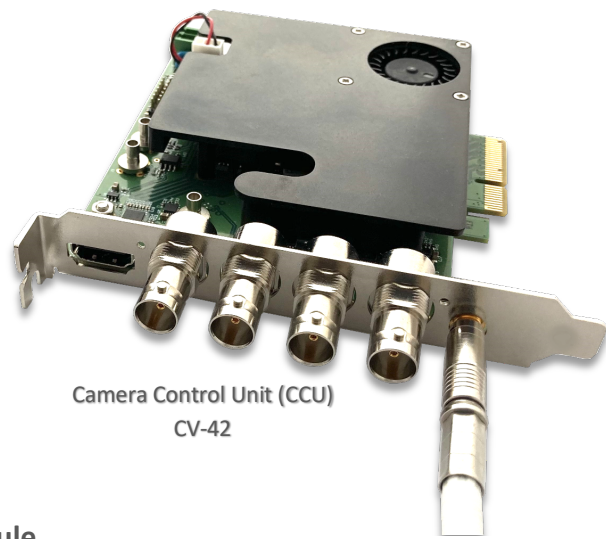


Endoscopy Square Camera Head  
Module



Camera Control Unit (CCU)  
CV-42

## 4K Endoscopy/Microscopy Camera Head Module

- Large ½ inch CMOS sensor chip with Full 4Kp60 (3840x2160 pixel) 10-bit image capture
- Enciris Vibrant Natural Color Processing
- Ultra-compact and ultra-low power design, consuming typically 1.5W
- General purpose I/O's provided in camera head module for endoscope control buttons
- Extended temperature operation
- Optimized for high reliability, designed for continuous 24/7 loaded operation
- CE Tested to 60601 ESD and EMI
- Designed and built in France

The Enciris 4K Camera Series and Camera Control Unit have been designed without compromise for best-in-class image performance. Offering crystal clear 4Kp60 images with vibrant natural color, very high resolution and extremely low noise in almost all lighting conditions. There are many innovations integrated to provide the absolute highest visual quality possible.

API control is provided for over 22 image processing controls including: Auto Exposure, Exposure Speed, Tone Mapping, Binning, Hue, Sharpness, Brightness Contrast, Sharpness, Noise Reduction, Flare Compensation, White Balance and many more parameters, with defaults provided for typical Endoscopy and Microscopy use-cases.

General purpose I/O connectivity is provided on the Camera Head Module for Endoscope buttons. I/O is also provided on the CCU card to permit buttons for Image Presets, Streaming, Recording, File Sharing etc.

The connecting cable between Camera and Capture Board is a highly flexible single-core coax which transmits the video data, power and general purpose I/O.

## Camera Cabling Simplified



Uses single-core coax



No multicore cabling required

- Permits use of highly flexible cabling
- Single core cable carries video, power and control button information

\* Although the product is designed for long term support Enciris, like all OEM manufacturers, is reliant on component supply  
 \*\* A typical customer application is less than 100 lines of code and Enciris provides example applications that allow cut and paste  
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## 4K Camera Control Unit CCU, CV-42

- 5 separate live display outputs: HDMI 2.0 and 4x 12G-SDI/3G-SDI, all provided with latency-free image injection overlay and transparency (alpha blending)
- Extremely low latency 4K capture, adapted for Live Display, Streaming, Recording, Storage and other high-performance Use-Cases
- Low power, typically 12W including camera
- PCIe Gen2 x4 bus
- General purpose I/O's provided in CCU card for control buttons
- Optimized for high reliability, designed for continuous 24/7 loaded operation
- CE Tested to 60601 ESD and EMI
- Designed and built in France

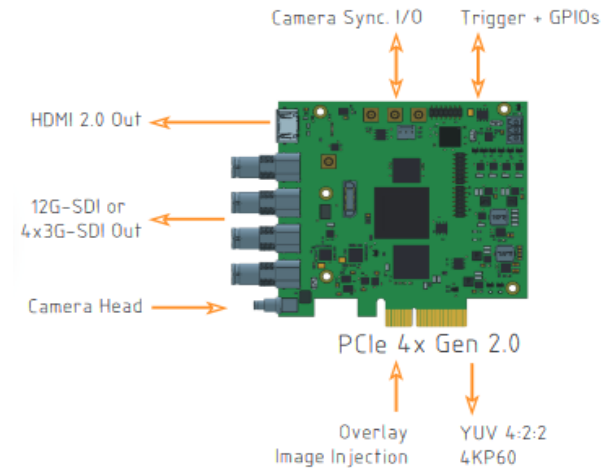


Figure 1, CV-42 I/O's

All Enciris 4K products include the Enciris-Empowered API with simultaneous multi-channel capture for Windows, Linux, Direct Show, Python, C++, C#, .NET and Golang. The API runs as a service and reduces time to market due to most typical use-cases being less than 100 lines of code\*\*. A demo application and Command Line Interface (CLI) are also provided for rapid evaluation so that no programming is required out of the box.

Ideal for AI use cases or Patient Information display: Overlay features are included for text, shape(s) and image injection with alpha blending, allowing customers to inject their own overlays and templates onto the incoming video streams, set required transparency levels and view this both on the HDMI direct out and via the host. Colour space conversion and colour adjustment are also provided.

Enciris products are engineered for ultra-high reliability, designed for 24/7 loaded operation and suited to Medical, Aerospace, Industrial, Military and other real-time and high-reliability use-cases. Customizable software and hardware platforms are available for special customer requirements.

## Software Recording Solution

Enciris-Empowered API\*\* provides easy integration support for:

- Multichannel
- H.264, H.265, MP4, JPEG, PNG...
- Nvidia, Intel Quick Sync, AMD VCN and FFMPEG

## Camera Module Versions

Version	Sensor Format (inches)	Pixel Size (µm)	RGB	MONO
CV40-s-bb-BC	1/2	1.85	X Standard Version	X On Request
CV40-s-bb	2/3	2.40	X On request	X On request
CV40-s-bb	1/3	1.55	X On request	

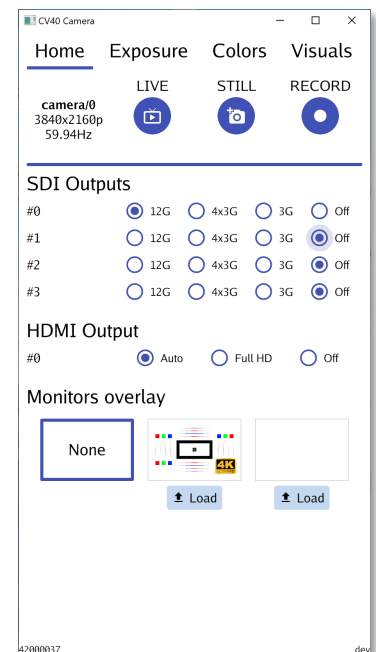


Figure 2, Demo Application

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