

U20CAM-1080PD&N-S1



1. General Description:

This USB camera module is a versatile and high-performance imaging solution designed for seamless integration across a wide range of platforms. Featuring broad compatibility, it works effortlessly with Windows, macOS, Linux, Ubuntu, and Android, and supports devices such as Raspberry Pi, Jetson Nano, ARM boards, notebooks, desktops, and tablets without requiring additional drivers thanks to its native UVC compliance. The camera delivers clear and smooth video capture up to 1080P@30fps, supporting both YUY2 and MJPEG formats with multiple selectable resolutions. Equipped with a high-quality low-noise MEMS microphone, it ensures natural and intelligible audio recording. With an advanced auto IR-Cut filter, the camera intelligently switches between vibrant daytime color and clear night vision, offering reliable imaging under varying light conditions. A wide field of view (FoV) of 110° diagonal and 95° horizontal provides broader coverage, while enhanced protection circuits with common mode filtering safeguard against ESD and EMI, guaranteeing stable operation in diverse environments.

This camera module is ideal for a variety of use cases, including video conferencing, online education, live streaming, and smart home monitoring. Its plug-and-play compatibility with Raspberry Pi and ARM-based boards makes it an excellent choice for AI vision projects, robotics, and IoT applications. The day and night functionality extends its use to security and surveillance systems, while the wide-angle lens ensures comprehensive scene coverage in industrial automation, retail monitoring, and research environments.

2. Features

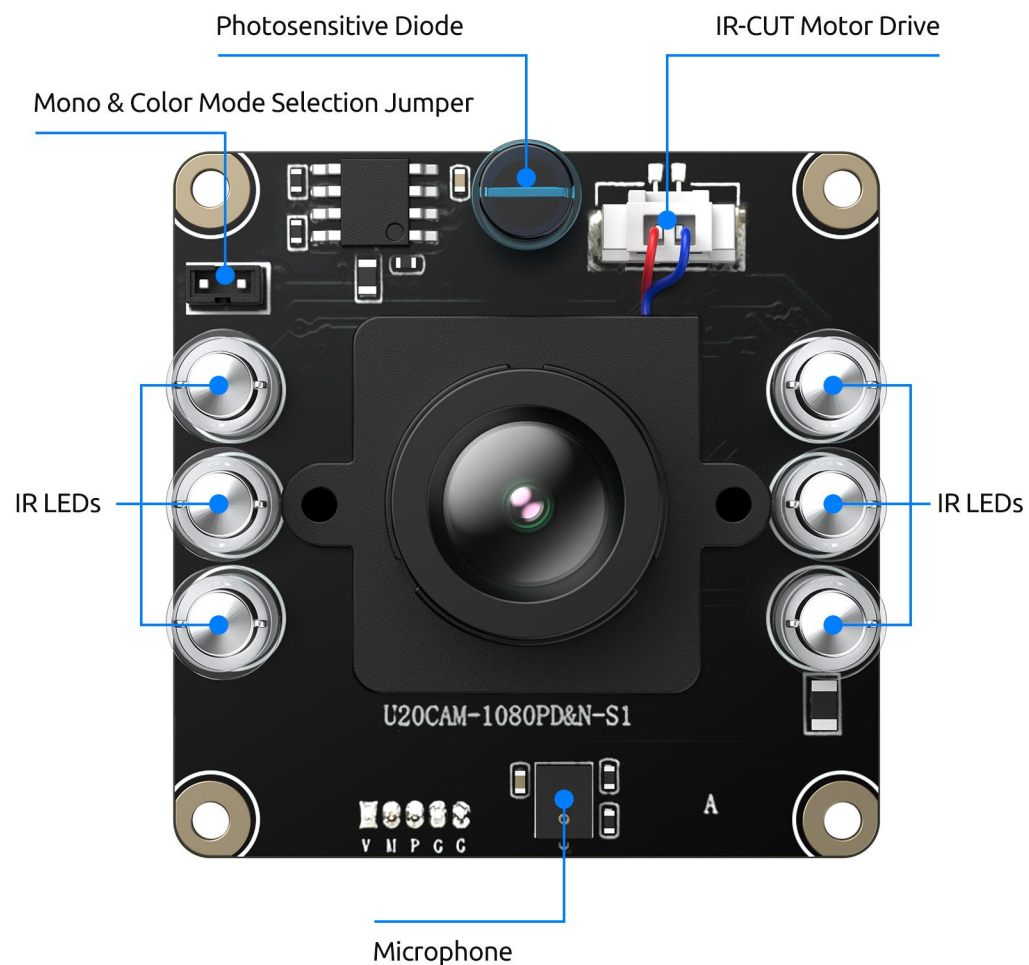
1. [Wide Compatibility] Works with Windows 11/10/7, Mac OS, Linux, Ubuntu, and Android. Fully compatible with Raspberry Pi, Jetson Nano, ARM boards, notebooks, desktops, and tablets. Plug & Play with native UVC driver, no additional driver required.
2. [High-Definition Performance] Captures video up to 1080P@30fps with support for YUY2 and MJPEG formats, plus multiple optional resolutions to fit your needs. High-quality, low-noise MEMS microphone for clear and natural sound capture.
3. [Day & Night Vision with Auto IR-Cut] Automatically switches between vivid daytime colors and clear night vision. Night mode can be set to color or black & white via the on-board jumper.
4. [Wide Angle] Fov(D) = 110 degrees and Fov(H) = 95 degree.
5. [Enhanced Protection] On-Board Common Mode Filter , Provide ESD/EMI protection on high-speed differential signal lines for improved electrostatic discharge protection and reduced signal noise, ensuring stable performance in various environments.

3. Technical Specification

Main Category	Subcategory	Specification Details
Sensor	Size	1/2.7 Inch
	Resolution	1920*1080
	Image Color	Colours
	Shutter type	Rolling shutter
Lens	F(N) /Aperture	2.2
	Focal Length	4
	TV DISTORTION	<-17%
	CRA	15 Degree
	Lens Diameter	M12
	Lens Seat Spacing	18mm
	FOV-D	110Degree
	FOV-H	95 Degree
PCB	Size	38*38 mm
	Layers	4 layers
	Mounting Holes	4 counts, Diameter 2.2mm
	Trigger	None
	Strobe Flash	None
	Night vision	Yes
	Microphone	MEMS microphone
	ESD/EMI	Yes
Interfaces	Communication Interface	USB 2.0 High-Speed
	Cable Length	1 M
Software	Device Name	Innomaker-U20CAM-1080PD&N-S1
	Communication	UVC 1.0.0

	Standard	
	Supported format	YUY2, MJPEG
	Supported Resolution Supported Frame rate	MJPEG Output resolutions: 1920*1080 @30fps 1280x800 @30fps 1280x720 @30fps 960x540 @30fps 848x480 @30fps 800x600 @30fps 640x480 @30fps 352x288 @30fps 320x240 @30fps YUY2 Output resolutions: 1920*1080 @4fps 1280x800 @10fps 1280x720 @10fps 848x480 @20fps 800x600 @20fps 640x480 @30fps
	Auto Parameters	White Balance Exposure
	Controllable Parameters	Brightness, Contrast, Hue, Saturation, Sharpness, Gamma, White Balance, Backlight Comp, Gain, Exposure, PowerLine Frequency, Low Light Compensation
	Support System	Windows , Linux , Mac Os, Android

4. Hardware Interface

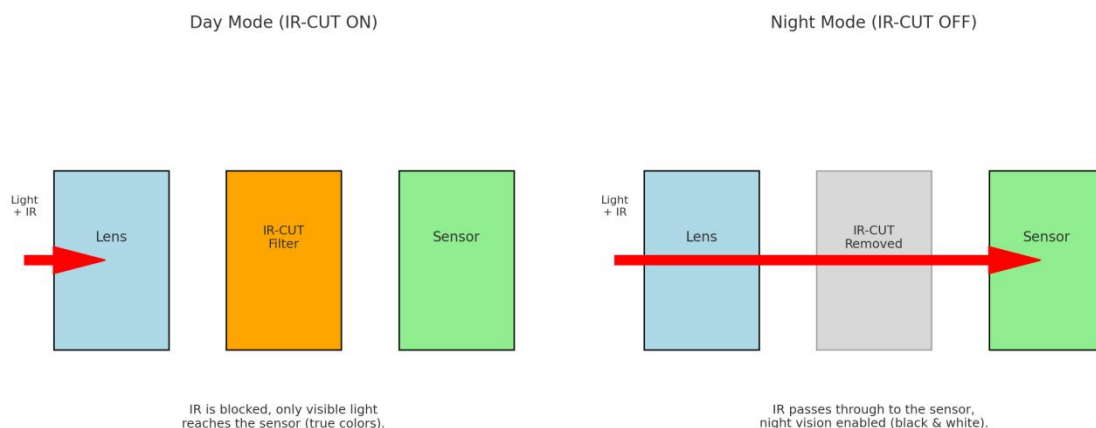


5. IR-CUT Function

5.1 The Concept Of IR-CUT

IR-CUT refers to an Infrared Cut Filter. In cameras or surveillance devices, an IR-CUT lens mount combined with a photosensitive component is typically required to enable automatic switching between day and night video capture.

In day mode, the IR-CUT filter is automatically engaged to block infrared light, ensuring more accurate and natural colors. In night mode, the filter is automatically removed to allow infrared light to reach the sensor, and with the assistance of IR LEDs, the camera can still produce clear images in low-light or dark environments.



5.2 The Design of IR-CUT

The U20CAM-1080PD&N-S1 camera board is designed for reliable day and night performance in complex, dynamically changing environments. It integrates six IR LEDs, a photosensitive diode, and a motor-driven IR-CUT mechanism to ensure seamless automatic switching between day and night modes.

Unlike traditional low-cost photoresistor designs, the onboard photodiode delivers faster and more accurate light detection, enabling precise transitions with minimal delay. For IR-CUT switching, the board adopts a motor-driven mechanism, the same approach widely used in high-end cameras. Compared with magnet-driven designs, motor drive provides greater stability, higher switching accuracy, and longer service life.

With this combination of advanced components, the U20CAM-1080PD&N-S1 achieves clear imaging and dependable day-night switching, making it especially well-suited for demanding surveillance and monitoring applications.

5.3 Color and B/W Options in Night Mode

In night mode, the display can be set to either black-and-white or color by adjusting the jumper cap on the board. When the jumper cap is inserted, the camera operates in black-and-white (Mono) mode. Removing the jumper cap switches the display to color mode. Please note that in color mode, the image may occasionally appear with a slight purplish tint due to the use of infrared illumination, which is a normal phenomenon.



6. User Manual Version Descriptions

Version	Description	Date	E-mail
V1.0.0.0		2025.09.09	support@inno-maker.com sales@inno-maker.com

If you have any suggestions, ideas, codes and tools please feel free to email to me. I will update the user manual and record your name and E-mail in list. Look forward to your letter and kindly share.