

# CAM-2D1L

Dual-View EO Camera with Integrated Laser  
Rangefinder

User Manual

rev: 260323  
Made in Taiwan

## Introduction

The **CAM-2D1L** is a compact dual-EO and laser rangefinder (LRF) payload, powered by dual Sony IMX415 sensors. This configuration pairs a wide-angle lens for situational awareness with a long-focal lens for precise target identification. Engineered for rapid UAV and robotic integration, it provides dual-view imaging and real-time distance measurement via a simplified interface of HDMI, UVC, and UART—eliminating the need for complex, custom camera stacks.

At its core, the CAM-2D1L features a high-performance embedded compute engine (quad-core 64-bit Arm with GPU/video acceleration) that manages real-time video, OSD overlays, and system control. For edge AI requirements, an integrated M.2 expansion slot supports optional acceleration modules, scaling performance to 13 or 26 TOPS. This extensibility transforms the CAM-2D1L from a standalone camera into a powerful, AI-ready compute platform.

## FEATURES

- **Dual EO imaging using two Sony IMX415 sensors**  
Wide-angle view for awareness and tele view for identification—both built on the IMX415 (Type 1/2.8, 8.46MP / 4K-class).
- **Dual-view output switching with operator-friendly zoom**  
Default wide view, switch to tele view, with 1x / 2x / 4x digital zoom modes.
- **Integrated laser rangefinder for real distance measurement**  
Class 1, 905nm, max range  $\geq 1000\text{m}$ , min range  $\geq 5\text{m}$ , with published accuracy model.  
Reference LRF module capability includes  $\geq 3\text{Hz}$  measurement frequency and UART control.
- **On-screen ranging overlay (OSD)**  
Center-point ranging with on-screen distance display toggleable.
- **Fast integration interfaces**  
Single HDMI video output, UVC out, and UART control for simple UAV/robot hookup.
- **High-performance embedded compute**  
Built on a quad-core Arm Cortex-A76 @ 2.4GHz with a VideoCore VII-class GPU/video pipeline, enabling real-time video handling, overlays, and system control.
- **Security & video-processing ready**  
Supports AES encrypted data transmission and H.264 video compression at the controller layer.
- **M.2 expansion for optional AI acceleration**  
M.2 interface supports optional AI modules, enabling 13 TOPS or 26 TOPS configurations per customer request.
- **Rich system I/O + flight-control integration**  
Supports HDMI / USB outputs, multiple control paths (USB / UART), and Pixhawk integration, enabling broader platforms beyond FPV.

## SPECIFICATIONS

Model Name	CAM-2D1L
<b>Technical</b>	
HDMI compliance	HDMI 2.0
HDMI Video bandwidth	up to 594 MHz
HDMI Video support	up to 3840x2160@60
UVC Video support	up to 3840x2160@60
Output TMDS signal	1.2 Volts [peak-to-peak]
Output DDC signal	5 Volts [peak-to-peak, TTL]
ESD protection	Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge]
PCB stack-up	6-layer board [impedance control — differential 90Ω、100Ω; single 50Ω]
Output	1xHDMI, 1xUSB(UVC), 1x RJ45
I/O	1x Wafer(UART), 1x USB
HDMI connector	Type A [19-pin female]
USB connector	Type C, Type A
<b>Mechanical</b>	
Housing	Metal enclosure
Fixedness	Wall-mounting case with screws
Power supply	5V DC
Power consumption	Watt [max]
Operation temperature	0~40°C [32~104°F]
Storage temperature	-20~60°C [-4~140°F]
Relative humidity	20~90% RH [no condensation]