EFFERENCE

GENERATION 1

CAMERA OVERVIEW & DATA SHEET

Ultra-Compact Embedded Peripheral for Wearable and Robotic Vision

The Efference M1 is a WiFi and Bluetooth-enabled embedded peripheral engineered for wrist and head-mounted applications in robotics, drones, and monocular systems. It delivers high-resolution imagery, a wide field of view, and precise localization and mapping; all while performing on-device inference with extreme resource efficiency.

Housed in an ultra-compact, modular form factor, the M1 functions as a versatile peripheral. It synchronizes seamlessly with other Efference devices or connects to USB-C enabled iPhones, utilizing a single cable for both power and ultra-fast, low-latency data transfer

M1 General Specifications

High-Performance Global Shutter Sensors

Capture high-speed motion with clarity using a best-in-class 2.3MP global shutter sensor, engineered with High Dynamic Range (HDR) and superior low-light sensitivity to perform in the most challenging lighting conditions.

Precision 6-DOF Inertial Measurement

Achieve ultra-low latency pose estimation and image stabilization through our proprietary sensor fusion algorithms, which integrate data from a 6-DOF IMU for stable, high-frequency spatial awareness.

Wireless Connectivity & Control

Bridge the gap between training and reality with integrated WiFi and Bluetooth; collect training data wirelessly and deploy to downstream robots with zero distribution shift, ensuring your models perform exactly as tested.

Seamless iPhone Compatibility

Streamline portable deployments by utilizing a USB-C enabled iPhone for simultaneous power and high-bandwidth data transfer, eliminating the need for bulky external batteries while significantly reducing system weight, cabling complexity, and cost.

Compact and Modular

Engineered to disappear into your build, this device packs full functionality into a quarter-sized footprint, allowing for seamless, unobtrusive integration into space-constrained deployments.

Efficient Edge Compute

Run lightweight models at the edge with 1.5 TOPS of compute, capable of running distilled and quantized depth, ISP, and hand-tracking models locally.

M1 Detailed Specifications

Dual Image Sensors

Sensor Type	1/2.6” 2.3MP RGB
Pixel Size	3.0µm x 3.0 µm
Shutter	Electronically Synchronized Global
Output Resolution	1920x1200 @ 60, 30, 15, 5, 1 fps 1920x1080 @ 60, 30, 15, 5, 1 fps [cropping mode] 960x600 @ 120, 60, 15, 5, 1 fps [binning 2x2 mode]
Dynamic Range	91.5 dB
Sensitivity	9606 mV/lux*s

Optics

Focal Length	2.3mm (0.1”)
Field of View	Max. 147° (H) x 94° (V) x 172° (D)
Aperture	f/2.0
TV Distortion	<-29.6%

Compute

CPU	Dual-core, up to 1.0 GHz
Memory	2 GB
NPU	1.5 TOPS @ INT8

Physical

Dimensions	28.0 x 24.0 x 32.0 mm (1.10 x 0.94 x 1.26”)
Weight	50g (0.77 lbs)
Interfaces	USB-C 3.2, Wi-Fi 6, Bluetooth 5
Mounting Options	Universal fast unlock system (bottom)
Power	USB-C 3.0 (PoC)
Operating Temperatures	-20 °C to 60 °C

Motion

Accelerometer Range	+/- 16G
Accelerometer Resolution	0.48 mg
Accelerometer Noise Density	4.0 mg
Gyroscope Range	+/- 1000 dps
Gyroscope Resolution	0.04 mg
Gyroscope Noise Density	0.08 dps
Output Data Rate	400Hz

H1 Technical Drawings