

AnchorCam Stereo

A compact embedded stereo-vision platform built around two synchronized global-shutter cameras, onboard AI processing, wireless connectivity and inertial sensing.

PRELIMINARY

IMAGING

Sensors	2 × onsemi AR0234CS, color CMOS 1/2.6-inch, 2.3 Mp global-shutter sensor
Resolution	2.3 MP per camera, 1920 × 1200 sensor active-pixel array
Frame rate	Dual-camera operating modes are under system characterization The prior sensor's mode table does not apply to this revision.
Stereo baseline	70 mm, fixed sensor centre to sensor centre, board centreline. Changed from 50.0 mm on 2026-08-11; the 70 mm figure is the one being built.
Shutter	Global, no motion artifacts in stereo capture
Optical format	1/2.6 in
Output	RAW 8/10-bit
Interface	Two-lane MIPI CSI per camera
Camera rails	Independent: 2.8 V analog, 1.8 V I/O, 1.2 V core
Synchronization	Shared SYNC/PWMSYNC for simultaneous exposure; external camera clock distribution
Control	Separate I ² C bus per camera
Lens mount	M12 × 0.5 board lens, interchangeable
Lens options	Fisheye 2.1 mm · Wide 4 mm · Standard 6 mm Field-of-view figures are being recalculated for the AR0234CS optical format and are not yet a system specification.

MAIN PROCESSOR

SoC	Rockchip RV1106G3, embedded Linux-capable vision processor
ISP	Hardware ISP, sensors up to 5 MP
NPU	1 TOPS, INT4 / INT8 / INT16 inference
Video	Hardware encoding
Camera	Dual-camera MIPI connectivity
Peripherals	Audio, USB, SD/MMC, SPI, UART, I ² C

WIRELESS

Controller	ESP32-C5-MINI-1-N4, pre-certified module, 4 MB flash espressif.com/en/products/modules · Selected 2026-08-13, replacing the bare ESP32-C6FH4 carried on the current board revision. Boards built before that change carry the C6FH4.
Wi-Fi	Dual-band 2.4 / 5 GHz Wi-Fi 6 On the ESP32-C5-MINI-1-N4. Boards still carrying the ESP32-C6FH4 are 2.4 GHz only, up to 150 Mbps.
Certification	Radio moves to a pre-certified module , so modular approval carries and the assembly does not repeat full intentional-radiator testing Planned. The current revision uses a bare controller.
Bluetooth	Bluetooth 5 LE
802.15.4	Thread, Zigbee (2.4 GHz narrowband, not UWB)
Ultra-wideband	802.15.4z UWB for wireless time distribution and ranging To be integrated. Not present on the current board revision.
RF	Dedicated PCB/chip antenna and matching network
Sync	Separate synchronization line (C6Sync)

MOTION SENSING

IMU	TDK InvenSense ICM-42631 invensense.tdk.com · Selected 2026-08-16, replacing the ST LSM6DS3TR-C carried on the current board revision.
Axes	3-axis accelerometer + 3-axis gyroscope, plus the magnetometer below for 9-axis
Interface	I ² C / SPI with interrupt
Use	Visual-inertial odometry, motion metadata
Magnetometer	MEMSIC MMC5983MA , 3-axis Selected 2026-08-13. Not fitted on the current board revision; it is what makes the 9-axis figure above.

MEMORY AND STORAGE

Flash	W25Q256JV , 256 Mbit / 32 MB Quad-SPI NOR Boot and firmware. This is the boot medium.
Removable	MicroSD over 4-bit SDMMC , card detect Recorded video and captured data. Not a boot or firmware medium. Corrected 2026-08-22; earlier issues of this sheet described the card as boot and firmware storage, which was wrong.

ON-DEVICE FACE REDACTION

Resolution	skip=0	skip=2	skip=4
480p	13.72	21.51	24.05
720p	9.09	11.81	12.52
1080p	5.33	5.99	6.16

Mosaic mode, end-to-end fps.

skip	decode	inference	redact	total	e2e fps	NPU/sec
0	18.2	51.3	1.4	71.0	13.72	13.72
1	20.0	28.6	1.4	50.0	18.85	9.4
2	23.0	19.3	1.5	43.9	21.51	7.2
3	25.8	15.0	1.4	42.1	22.67	5.7
4	26.3	11.9	1.4	39.6	24.05	4.8
5	27.1	10.0	1.4	38.5	24.67	4.1

480p. Milliseconds per stage. skip is frames skipped between face-detection passes; NPU/sec is the resulting detection refresh rate in Hz.

SECURITY

Element	Microchip ATECC608A , I ² C
Function	Fitted on the board. Hardware-protected key storage, device identity and authentication in the element are planned; the current firmware does not use it.
Secure boot	Root of trust is the RV1106 BootROM verifying the signed loader against a public-key hash in OTP fuses, not the secure element
Root filesystem	SquashFS, read-only at runtime

AUDIO

Microphone	Onboard MEMS, differential input
Conditioning	Dedicated mic bias and codec power filtering

EXTERNAL INTERFACES

USB Type-C — USB 2.0 data, battery/USB power input
MicroSD slot
20-pin board-to-board expansion connectors
Debug and programming connections
Camera control and synchronization signals

POWER

Charger	TI BQ24075 , single-cell Li-ion/LiPo, USB-powered
Power path	Operation while charging
Battery	Temperature monitoring
Rails	Switching regulators for 3.3 V, 1.8 V, 1.3 V, 1.2 V and dedicated camera supplies
Isolation	Ferrite-bead separation of noisy and sensitive rails

INTENDED APPLICATIONS

Stereo depth estimation, visual odometry
Robotics and drones
Motion capture, machine vision
AI-enabled security cameras
Spatial sensing
Battery-powered connected vision devices

**THIS SHEET IS CHANGED BY THE PEOPLE WHO
READ IT**

70 mm baseline, up from 50.0 mm, because buyers said 50 mm was too short for the working distances they cared about.

9-axis IMU, ICM-42631 plus MMC5983MA, because a customer asked for a magnetometer for calibration.

Pre-certified radio module, ESP32-C5-MINI-1-N4 replacing the bare ESP32-C6FH4, because a partner pointed out that a bare controller forces full intentional-radiator testing in every market.

If a part, an interface or a tolerance here does not work for you, write to yejun@mutual.solutions. Every change listed above started as one email or one message. Tell us what you need the board to do and we will tell you plainly whether it is in, out, or not decided yet.

Preliminary. Figures above are component specifications from vendor datasheets and the current board design. System-level performance has not been fully characterized and is subject to change. The project comprises two schematic sheets and a routed PCB layout. GNSS and cellular hardware present in our MonoSync design are not fitted on this stereo version.

mutual Solutions, Inc.

mutual.solutions

yejun@mutual.solutions