



IRMODULES

EO/IR IMAGING
MODULES



IRMODULES.

Product Catalog — EO/IR Imaging Modules & AI Imaging Systems

LWIR / MWIR / SWIR / VISIBLE / DUAL-BAND / AI

2026 EDITION • IRMODULES.COM

Precision imaging cores, engineered in Wuhan's Optics Valley

IRmodules is based in **Wuhan's Optics Valley**, a premier national high-tech industrial zone and a hub for military-civil fusion innovation in China. Since 2016, we have specialized in multi-spectral imaging research and solutions, assembling a core team with expertise across the full spectral range: visible, low-light, SWIR, MWIR and LWIR.

Our team developed the **industry's first single-chip LWIR + low-light dual-band module**, delivering the smallest size, lowest power consumption, minimal latency and integrated synchronization in its class. We support China's top research institutes and have successfully transitioned multiple projects into production.



2016

FOUNDED IN WUHAN'S OPTICS VALLEY

Full-spectrum

VISIBLE → SWIR → MWIR → LWIR

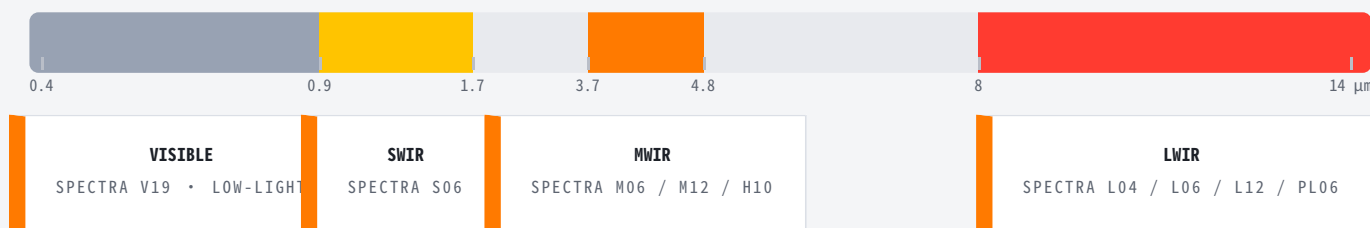
31 modules

ACROSS 7 PRODUCT FAMILIES

Gazelle

OPTICS VALLEY HIGH-GROWTH ENTERPRISE

SPECTRAL COVERAGE



Upstream module supply

Thermal and multi-spectral imaging cores for EO/IR system integrators — UAV payloads, gimbals, border security, industrial thermometry and defense OEM programs.

Deep customization

Interface variants, lens and FOV configurations, radiometric calibration and firmware tailored to the host platform.

Production-scale delivery

From prototype lots to volume production, with datasheets, SDKs and engineering support in six languages.

Three families, every band

SPECTRA

SINGLE-BAND MODULES • 28 MODELS

Uncooled LWIR from 384×288 to 1280×1024, cooled MWIR, InGaAs SWIR, polarimetric LWIR and visible/low-light cores.

FUSION

DUAL-BAND MODULES • 2 MODELS

Single-chip LWIR + visible dual-band imaging — the smallest, lowest-power synchronized dual-spectrum modules in their class.

NEXUS

AI IMAGING SYSTEMS • 1 MODEL

Single-board EO/IR module with embedded deep-learning tracking above 50 Hz, streaming H.265 over Ethernet.

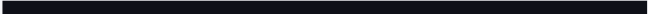
MODEL	RESOLUTION	BAND	NETD	FORM / NOTE
UNCOOLED LWIR • 8–14 MM				SPECTRA L-series
L04C	384×288	LWIR	≤40 mK	Ultra-compact 26×26 mm
L04S	384×288	LWIR	≤30 mK	Shutterless
L04T ★	384×288	LWIR	≤40 mK	Shutterless, 21×21 mm WLP
L04U	384×288	LWIR	≤30 mK	Ultra-compact 22.2×22.2 mm
L06C	640×512	LWIR	≤40 mK	Ultra-compact 26×26 mm
L06NT ★	640×512	LWIR	≤20 mK	Network module + SDK
L06S	640×512	LWIR	≤30 mK	Shutterless
L06T1	640×512	LWIR	≤40 mK	Ultra-mini 17.3×17.3 mm
L06T2 ★	640×512	LWIR	≤40 mK	Shutterless, 21×21 mm WLP
L12A	1280×1024	LWIR	≤40 mK	12 μm HD core
L12E ★	1280×1024	LWIR	≤30 mK	Network + 50 mm F1.0 lens
L12N	1280×1024	LWIR	≤30 mK	Network module
L12S	1280×1024	LWIR	≤30 mK	Shutterless
L12T ★	1280×1024	LWIR	≤40 mK	Shutterless • 50 Hz
COOLED MWIR • 3.7–4.8 MM				SPECTRA M / H-series
M06A	640×512	MWIR	16 mK	15 μm cooled core
M12A ★	1280×1024	MWIR	≤40 mK	10 μm MCT, 30–150 mm zoom
H10A	1024×768	MWIR	≤40 mK	HOT cooled, 10 μm
SWIR • POLARIMETRIC				SPECTRA S / PL-series
S06A ★	640×512	SWIR	—	InGaAs 0.9–1.7 μm, 15 μm
PL06A ★	640×512	LWIR	—	Polarimetric, 7 μm pitch
VISIBLE / LOW-LIGHT				SPECTRA V-series
V19A	1920×1080	VIS	—	Modular visible core
V19B / V25 / V38	up to 4K	VIS	—	Split-type visible module
Low-Light VIS/NIR	1920×1080	VIS+NIR	—	400–950 nm + 1064 nm option
DUAL-BAND & AI				FUSION • NEXUS
FUSION LV0625A	640×512 + 5MP	LWIR+VIS	—	Dual-spectrum, ≤70 g
FUSION LV1225A ★	1280×1024 + 3MP	LWIR+VIS	—	Single-chip dual-band
NEXUS LV0619B ★	640×512 + 1080p	LWIR+VIS	—	AI tracking >50 Hz



FEATURED • UNCOOLED LWIR • SWAP CORES

Shutterless, 21×21 mm

FIELD CASE — HANDHELD THERMOMETRY SCREENING



LWIR 8-14 MM • SHUTTERLESS

SPECTRA L04T

384×288 Uncooled LWIR Module



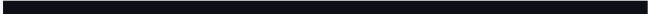
Ultra-mini shutterless core on a high-refresh 12 μm WLP detector and our 2nd-generation ASIC-ISP. Radiometric -20 to 650 °C with spot/line/area analysis; seven fixed-focus lens options for handheld thermometry and smart integration.

DETECTOR	VOx uncooled FPA • 12 μm
RESOLUTION	384×288
NETD	≤40 mK @ 25 °C, F1.0
FRAME RATE	30 Hz (30/60 Hz option)
NUC	Shutterless correction
PROCESSOR	2nd-gen ASIC-ISP
DIGITAL VIDEO	DVP / BT656 / USB 2.0 / MIPI
ANALOG VIDEO	PAL / NTSC
CONTROL	UART / I2C / USB 2.0
POWER	5 V • <0.42 W typ. (USB)
DIMENSIONS	21×21×10.3 mm • <7 g
THERMOMETRY	-20-150 / 100-650 °C • ±2 °C or ±2%
OPERATING TEMP.	-40 ~ +80 °C

Lenses — 4 / 6.8 / 9.1 / 15 / 19 / 25 / 35 mm fixed-focus

Applications — Handheld thermometry • smart devices • temperature screening

irmodules.com/products/ir-modules/spectra-l04t



LWIR 8-14 MM • SHUTTERLESS

SPECTRA L06T2

640×512 Uncooled LWIR Module



VGA thermal in the same 21×21×10.3 mm footprint: 30/60 Hz over USB, DVP, BT656 or MIPI, radiometry to 650 °C at ±2 °C — under 8.6 g and 0.7 W for demanding SWaP integrations.

DETECTOR	VOx uncooled FPA • 12 μm
RESOLUTION	640×512
NETD	≤40 mK @ 25 °C, F1.0
FRAME RATE	30 Hz (30/60 Hz option)
NUC	Shutterless correction
PROCESSOR	2nd-gen ASIC-ISP
DIGITAL VIDEO	DVP / BT656 / USB 2.0 / MIPI
ANALOG VIDEO	PAL / NTSC
CONTROL	UART / I2C / USB 2.0
POWER	5 V • <0.7 W typ. (USB)
DIMENSIONS	21×21×10.3 mm • <8.6 g
THERMOMETRY	-20-150 / 100-650 °C • ±2 °C or ±2%
OPERATING TEMP.	-40 ~ +80 °C

Lenses — 9.1 / 13.5 / 15 / 18 / 25 / 35 mm fixed-focus

Applications — UAV payloads • robotics • SWaP-critical OEM integration

irmodules.com/products/ir-modules/spectra-l06t2

FEATURED • UNCOOLED LWIR • HD & NETWORK

HD thermal, online everywhere

FIELD CASE — SMART-CITY TRAFFIC MONITORING

LWIR 8-14 MM • 50 HZ • SHUTTERLESS

SPECTRA L12T

1280×1024 Uncooled LWIR Module



HD thermal at up to 50 Hz (30 Hz thermometry) with fused shutterless algorithms, under 26 g and 1.3 W. Preloaded image modes for UAV search, security monitoring, wildfire detection and driving assistance.

DETECTOR	VOx uncooled FPA • 12 μm
RESOLUTION	1280×1024
NETD	≤40 mK @ 25 °C, F1.0
FRAME RATE	50 Hz imaging • 30 Hz thermometry
NUC	Fused shutterless algorithms
FUNCTIONS	External sync • contour overlay
DIGITAL VIDEO	DVP / BT1120 / MIPI / USB 3.0
CONTROL	UART / I2C
POWER	5 V • <1.3 W typ. (USB)
DIMENSIONS	≤29×29 mm • <26 g
THERMOMETRY	-20~150 / 50~600 °C • ±2 °C or ±2%
OPERATING TEMP.	-40 ~ +80 °C

Lenses — 19 / 35 / 55 mm F1.0~1.1 fixed-focus

Applications — UAV search • security monitoring • wildfire detection • driving assist

irmodules.com/products/ir-modules/spectra-l12t

LWIR 8-14 MM • IP NETWORK

SPECTRA L06NT

640×512 Network Imaging Module



High-accuracy network thermal module: array thermometry with standard IP protocols and a rich SDK. A compact 45×45 mm core for security monitoring, industrial inspection and online thermometry terminals.

DETECTOR	VOx uncooled FPA • 12 μm
RESOLUTION	640×512
NETD	≤20 mK
STREAM	25/30 Hz
ENCODING	H.264 / H.265 / MJPEG
PROTOCOLS	RTSP • ONVIF • GB/T 28181 • DHCP • NTP
NETWORK	100M / 1000M Ethernet
CONTROL	RS232 / RS422 / RS485 (Pelco-D)
STORAGE • SDK	32G eMMC • Windows / Linux SDK
POWER	DC 9~15 V • PoE • 3 W typ.
DIMENSIONS	45×45 mm
THERMOMETRY	-20~150 / 100~550 °C • ±2 °C or ±2%
PROTECTION	Window IP67 • -40 ~ +70 °C

Lenses — 4.8 / 7 / 9.1 / 13 / 25 mm fixed-focus

Applications — Security monitoring • industrial inspection • online thermometry

irmodules.com/products/ir-modules/spectra-l06nt



FEATURED • LONG-RANGE & COOLED MWIR

Reach the far perimeter

FIELD CASE — BORDER ELECTRONIC SENTRY

LWIR 8-14 MM • TELEPHOTO NETWORK

SPECTRA L12E

1280×1024 Network Module • 50 mm F1.0



Athermalized 50 mm F1.0 telephoto (17.5°×14.0° FOV), RTSP H.264/H.265 over Gigabit Ethernet with ONVIF and GB/T 28181, RS485 Modbus RTU — for long-range surveillance, perimeter protection and fire detection. -40 ~ +70 °C.

DETECTOR	VOx uncooled FPA • 12 μm
RESOLUTION	1280×1024
NETD	≤30 mK (F1.0, 25 °C)
FRAME RATE	25/50 Hz (delivery firmware)
LENS	50 mm F1.0 athermalized fixed
FOV	17.5°×14.0° (H×V)
DRI (EST.)	3540 / 1180 / 590 m
ENCODING	H.264 / H.265 / MJPEG • RTSP
PROTOCOLS	ONVIF • GB/T 28181
SERIAL	RS485 • Modbus RTU
POWER	DC 12 V (9-24 V) • <4 W
DIMENSIONS	44.5×44.5×93.4 mm
PROTECTION	Front IP67 • -40 ~ +70 °C
START-UP	≤8 s
PROCESSING	NUC / 3DNR / DNS / DRC / EE

Applications — Perimeter security • long-range watch • fire detection

irmodules.com/products/ir-modules/spectra-l12e

MWIR 3.7-4.8 MM • COOLED HgCdTe

SPECTRA M12A

1280×1024 Cooled MWIR Module



Cooled MWIR on a 10 μm HgCdTe detector at F4.0, shipping with a 30-150 mm continuous-zoom lens. SDI, CameraLink or MIPI video with RS422 control — the long-range heart of demanding EO/IR systems.

DETECTOR	HgCdTe (MCT) cooled • 10 μm
RESOLUTION	1280×1024
SPECTRAL	3.7-4.8 μm
NETD	≤40 mK @ 25 °C
FRAME RATE	25 Hz
LENS	F4.0 • 30-150 mm continuous zoom
FOV	24.1°×19.4° ~ 4.9°×3.9°
COOL-DOWN	≤6 min at room temperature
VIDEO	SDI / CameraLink / MIPI
CONTROL	RS422 • 115200 bps
POWER	12-32 V by configuration
DIMENSIONS	≤234×118×116 mm • ≤2.5 kg
OPERATING TEMP.	-40 ~ +60 °C

Applications — Border & coastal surveillance • airborne reconnaissance • long-range EO/IR

irmodules.com/products/ir-modules/spectra-m12a

FEATURED • SWIR & POLARIMETRIC

Beyond the thermal image

FIELD CASE — LASER ADDITIVE MELT-POOL MONITORING

SWIR 0.9–1.7 μm • InGaAs

SPECTRA S06A

640×512 InGaAs SWIR Module



Short-wave infrared with 15 μm pitch, 50 Hz Camera Link and global exposure from 20 μs to 19 ms — for laser spotting, semiconductor inspection and imaging through haze.

DETECTOR	InGaAs SWIR
RESOLUTION	640×512
PIXEL PITCH	15 μm
SPECTRAL	0.9–1.7 μm
LENS	25 mm athermalized • F/1.4–16
FOV	21.7°×17.4° • distortion <1.5%
EXPOSURE	Global • 20 μs – 19 ms
VIDEO	Camera Link • Y8 / Y16 / X16
CONTROL	RS422
POWER	DC 6–19 V • <4.5 W
DIMENSIONS	45×45 mm class
DIGITAL ZOOM	1× / 2× / 4×
ENHANCEMENT	Detail enhancement 0–7 levels
SYNC	Internal / external
TEST PATTERN	Gradient / checkerboard

Applications — Laser spotting • semiconductor inspection • imaging through haze

irmodules.com/products/ir-modules/spectra-s06a

LWIR 8–14 μm • POLARIMETRIC

SPECTRA PL06A

640×512 Polarimetric LWIR Module



Polarization-sensitive long-wave core in a 45×45 mm footprint. Reads polarization signatures to expose camouflaged targets and discriminate materials that look identical in conventional thermal.

TYPE	Polarimetric LWIR imaging
SPECTRAL	8–14 μm
RESOLUTION	640×512
PIXEL PITCH	7 μm
VIDEO	Camera Link
CONTROL	RS232
POWER	DC 12 V
DIMENSIONS	45×45 mm
LENS OPTIONS	Fixed athermalized / continuous zoom / motorized / dual-FOV

Applications — Camouflaged-target detection • material discrimination

irmodules.com/products/ir-modules/spectra-pl06a

FEATURED • DUAL-BAND & AI

Two spectra, one board

FIELD CASE — HELMET-MOUNTED FUSION IMAGING

LWIR + VISIBLE • SINGLE-CHIP

FUSION LV1225A

Single-Chip Dual-Band Module



Up to 1280×1024 LWIR with 2560×1440 visible imaging on a single 35×35 mm board — the industry's first of its kind. CML or MIPI output drops straight into SoC and FPGA platforms.

ARCHITECTURE	Single-chip LWIR + visible
THERMAL	1280×1024
VISIBLE	2560×1440
CONFIGURATIONS	IR-priority / VIS-priority
VIDEO	CML / MIPI
FOOTPRINT	35×35 mm
INTEGRATION	Direct to SoC / FPGA platforms
SIBLING	LV0625A — $640 \times 512 + 2560 \times 1920$ • ≤ 70 g

Applications — Helmet & handheld fusion • situational awareness • smart sights

irmodules.com/products/dual-band-modules/fusion-lv1225a

EO/IR • EMBEDDED AI TRACKING

NEXUS LV0619B

Single-Board AI Tracking Module



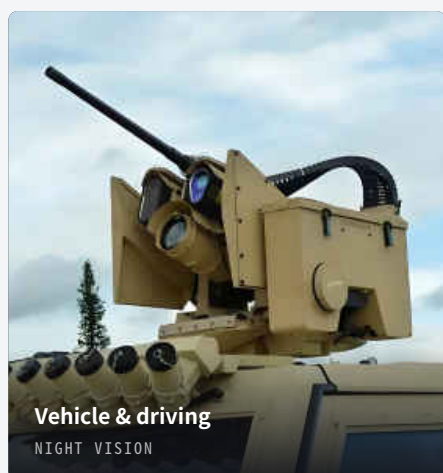
Dual-channel 640×512 thermal + 1080p visible with an embedded AI platform: deep-learning tracking above 50 Hz and H.265 video over 100 Mbps Ethernet, on one board.

THERMAL	640×512 • $12 \mu\text{m}$ VOx
VISIBLE	1920×1080 • RGB24
NETD	≤ 40 mK
AI TRACKING	>50 Hz deep-learning
OUTPUT	50 Hz • H.265
NETWORK	100 Mbps Ethernet • UDP / RTSP
CONTROL	Ethernet / RS422 / SPI
POWER	DC 5.5 V • ≤ 10 W
DIMENSIONS	$70 \times 60 \times 16.6$ mm • ≤ 140 g
RECORDING	MKV / MP4 • 4 h loop
OPERATING TEMP.	$-40 \sim +70$ °C
EMC	CE102 – RS103 (system-level)
START-UP	≤ 15 s
STORAGE TEMP.	$-45 \sim +80$ °C
SHOCK	Axial ≥ 80 g (300 ms) • radial ≥ 10 g
ALTITUDE	20,000 m

Applications — Border e-sentry • vehicle systems • autonomous target tracking

irmodules.com/products/ai-imaging-systems/nexus-lv0619b

Built into your system, wherever it works



Interface & firmware variants

Video output, control protocol and firmware adapted to your host architecture.

Radiometric calibration

Factory-calibrated temperature measurement with spot, line and area analysis.

Lens & FOV configuration

Fixed-focus athermalized, continuous-zoom, motorized and dual-FOV options per model.

SDK & documentation

SDKs, datasheets and engineering support — documentation in six languages.

Interfaces

USB 2.0

MIPI

DVP

BT656 / BT1120

Camera Link

SDI

CML

GigE / RTSP

RS232 / RS422 / RS485

PAL / NTSC

ONVIF

CONTACT

IRMODULES.

From uncooled LWIR to cooled MWIR, single-band to AI-integrated dual-band — precision imaging cores for EO/IR system integrators worldwide, engineered and manufactured in Wuhan, China.

SALES

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OEM inquiries, customization & volume pricing

GENERAL

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Technical documentation & support

WEB

irmodules.com

Datasheets, case studies & knowledge base in six languages

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Specifications are subject to change without notice. Current datasheets are available at irmodules.com/downloads. Product images are illustrative. Export of certain thermal imaging products may be subject to local regulations — contact our team for compliance guidance.