IC-50-U

Mid-Wave Infrared Hyperspectral Camera

2700–5300 nm push-broom imaging on an HgCdTe detector — unique spectral signatures for hydrocarbons, gases, hot targets and minerals.



2700–5300	≥170	338	14-bit
nm MWIR window	fps push-broom	spectral channels	effective depth

IC-50-U — MWIR HYPERSPECTRAL CAMERA · 423-365

01
MWIR-SIGNATURE DETECTION

HgCdTe sensing in the 3–5 µm atmospheric window captures hydrocarbons, VOCs, hot objects and minerals SWIR cannot see.

02
REFLECTIVE GRATING OPTICS

Folded reflective-grating design: lower MWIR transmission loss and chromatic error with balanced resolution and throughput.

03
HIGH SPEED & DYNAMIC RANGE

640 × 512 native resolution, 14-bit effective depth, ≥ 170 fps — matched to fast belt lines and UAV push-broom.

04
338 SPECTRAL CHANNELS

7.7 nm sampling across 338 bands restores the full continuous spectrum for reliable classification and quantitation.

KEY ADVANTAGES

- 2700–5300 nm mid-wave window where hydrocarbons, volatile gases and minerals show exclusive absorption features
- Spectral resolution better than 30 nm with 7.7 nm sampling — complete spectral curve per pixel, not just band ratios
- Push-broom imaging at ≥ 170 fps avoids motion distortion on conveyor belts, drones and vehicle platforms
- 14-bit effective sampling depth handles large temperature-difference scenes — hot processes and ambient backgrounds together
- GigE interface and 24 V DC supply for direct integration into industrial sorting cabinets and inspection stations
- 45° field of view at 23 mm focal length, 1.3 mrad IFOV — wide-area coverage with precise spatial attribution
- Industrial on-line sorting of polymer waste by resin type, grade and additive content
- 0 °C to +40 °C operating range for factory floors, outdoor scanning and field exploration rigs

SYSTEM OVERVIEW

HgCdTe DETECTOR
Cooled-class mercury cadmium telluride focal plane, 640 × 512 native format with 15 µm pixels — the benchmark detector for 3–5 µm spectroscopy.

FOLDED REFLECTIVE GRATING
All-reflective dispersion path: minimal MWIR transmission loss and chromatic aberration compared with transmissive optics.

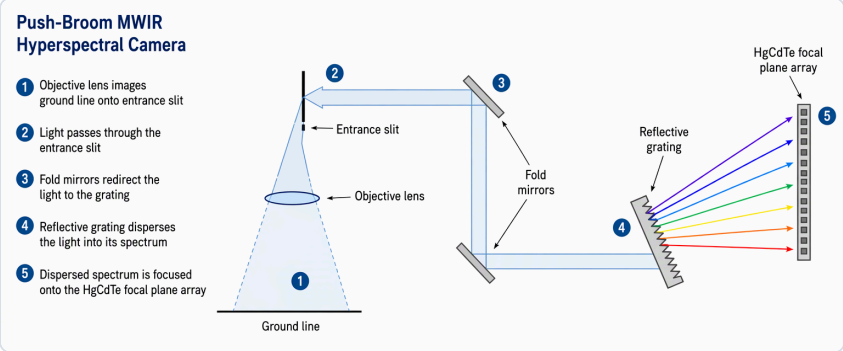
PUSH-BROOM IMAGING
Line-by-line spectral scanning at up to 170 fps — full spectra for every point of the moving target.

WIDE FOV OPTICS
23 mm lens gives 45° FOV and 1.3 mrad IFOV for standoff surveys and belt mounting.

GigE DATA LINK
Standard GigE vision output streams 338-band cubes to industrial PCs without frame grabbers.

RUGGED THERMAL DESIGN
Stable 0–40 °C operation with −20 to +60 °C storage for field and factory duty.

HOW IT WORKS



The objective images a scene line onto the entrance slit; fold mirrors route it to the reflective grating, which disperses 338 MWIR bands onto the HgCdTe focal plane array.

APPLICATION AREAS

POLYMER WASTE SORTING
Identify resin type and grade of waste plastics by MWIR spectral signatures on the belt.

Configured with: IC-50-U — belt-line mount, GigE to sorting controller

HIGH-TEMP MATERIAL INSPECTION
Non-contact composition analysis of hot materials on production lines.

Configured with: IC-50-U — 14-bit depth for large temperature spans

GEOTHERMAL & MINERAL SURVEY
Map mineral and geothermal indicators from spectral absorption features in the field.

Configured with: IC-50-U — 45° FOV for wide-area scanning

GLUE & LUBRICANT QC
Verify organic coatings, adhesives and lubricants on assembled parts.

Configured with: IC-50-U — laboratory bench configuration

METAL SURFACE CONTAMINATION
Detect organic films and residues on machined metal surfaces.

Configured with: IC-50-U — high-resolution mode, 1×1 binning

SPECIAL-TARGET SPECTRAL ANALYSIS
Acquire and analyze infrared signature spectra of designated targets.

Configured with: IC-50-U — tripod / vehicle / UAV push-broom

TECHNICAL SPECIFICATIONS

Model	IC-50-U (part no. 423-365)
Dispersion method	Folded reflective grating
Spectral range	2700–5300 nm
Spectral resolution	Better than 30 nm
Sampling interval	7.7 nm
F-number	F/4
Detector	HgCdTe, 640 × 512 native, 15 µm pixels
Bit depth / binning	14-bit effective; 1×1 recommended
Spectral bands	338
FOV / IFOV	45° @ 23 mm / 1.3 mrad @ 23 mm
Frame rate	≥ 170 fps
Interface / power	GigE; 24 V DC
Environment	0 °C to +40 °C operating, −20 °C to +60 °C storage