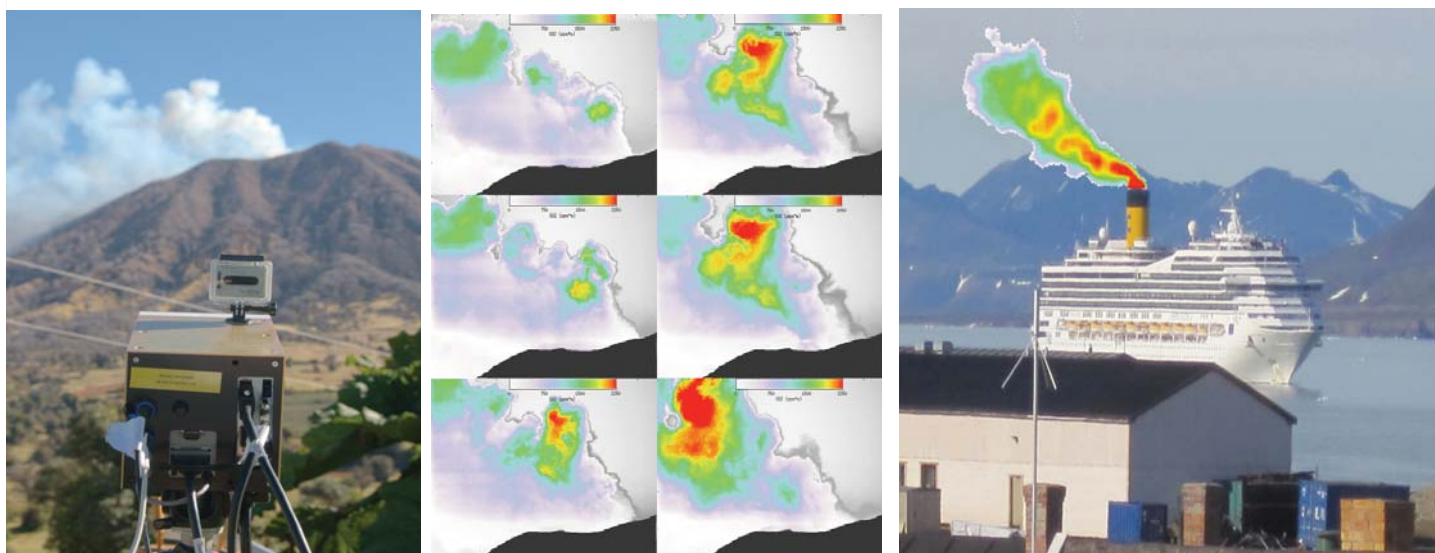


Envicam-2

Fast-sampling UV Multispectral Imaging Camera



Envicam-2 provides the fastest sampling (~10 Hz) imaging camera available on the market. With an integrated spectrometer and webcam, Envicam-2 is ideal for monitoring emissions from industrial complexes, ships and has been tested as several erupting volcanoes. It has also been used at industrial plants to measure gases, including industrial plumes from plants in Australia, Romania, South Africa and Norway. Measurements like these can be used to assess the emission rates of gases and help to mitigate adverse effects on the environmental and human health.



Envicam-2 monitoring SO₂ emissions from Turrialba volcano, Costa Rica. The sequence of images (centre panel) show SO₂ path concentrations (gm⁻²) taken at intervals between 0.1 and 5s. By tracking features in the plume, fluxes or emission rates (kg s⁻¹) can be determined. Emissions from moving ships can also be estimated in real-time with minimum setup time.

Envicam-2 integrates the Hamamatsu C8484 UV camera with a UV spectrometer and webcam to provide a complete set of measurement data for quantifying fugitive emissions rapidly and accurately. The camera provides 1344 x 1024 pixels and by using Envicam-2's four-position filter wheel, spectral selection can be achieved. The spectrometer is co-aligned with the camera axis to provide a ~0.3 nm resolution spectrum within the field-of-view of the camera. The webcam allows the user to view the scene in real-time using visible light and maintain a visual record of the data capture.

UV radiation is measured using a high quantum efficiency CCD after passing through special narrowband filters that select radiation where certain gases strongly scatter or absorb radiation. The region between 280-320 nm can be used to estimate SO₂ path concentrations, while other gases, for example NO₂, can be measured between 400-500 nm.

Technical Specifications

	Camera	Spectrometer	Webcam
Total field-of-view	~6 - 15°	~1° (adjustable)	160°
Optics	optional 12, 25 50 mm C-mount lens F/3.5	5 mm diameter F/2	
Image Size	1344 x 1024 pixels	1024 pixels	640 x 512 pixels
Spectral Resolution	4 filters narrowband ~10 nm	~0.3 nm (FWHM)	RGB
Filter 1	307 nm	-	-
Filter 2	325 nm	-	-
Filter 3	User Specified	-	-
Filter 4	User Specified	-	-
Sampling rate (max)	35.7 Hz (4x4 binning)	1000 Hz	25 Hz
Exposure setting	1 µs-1 s	1 ms-10 s	-
Detector	Progressive scan in-line CCD	Sony ILX511B CCD	CCD
Digitization	12 bits	16 bits	16 bits
Accuracy (SO ₂)	± 0.1 gm ⁻²	-	-
Operating range	- 10 °C to + 50 °C	-30 °C to +70 °C	-10 °C to +50 °C
Interfaces	PCI/CameraLink	USB 2.0	USB 2.0
Power requirements	2 V, 3 A, 40 W Peak		
Total weight	9 kg		
Total dimensions	300 mm x 200 mm x 90 mm (LxWxH)		

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