

Gas detection

« Remotely detect, identify and monitor all detectable gases simultaneously over an extra large field of view with the revolutionary and unique **SPIM** systems »

Hyperspectral Infrared camera

The ATIS 2.0 infrared hyperspectral cameras with very large field of view (up to 60°) are able to **detect** and **identify** numerous gases **simultaneously** up to 5km away from the cameras.



Hyperspectral technology

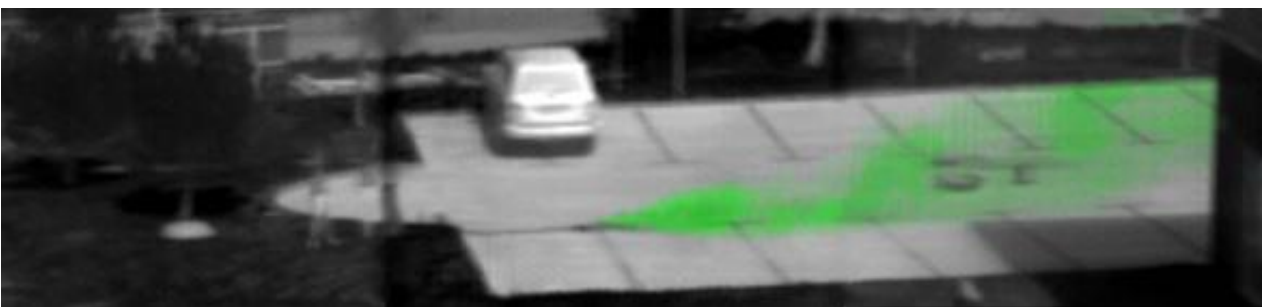
ATIS 2.0 technology, based on Hyperspectral imagery, allows obtaining for each pixel in the infrared image, a spectral response of more than 100 measured points per pixel. This obtained information is generally called "hypercube". A Hypercube is a three-dimensional representation of an observable physical phenomenon, like spectral luminance (expressed in watts per steradian per square meter and per micron), represented in function of the two spatial dimensions and the spectral dimension.

Recognising the received spectrum allows to determine the nature of the background and the gases in between the background and the sensor head, as long as the elements in the background and the gases have a particular spectral signature in the observed band.

The importance of the signature is linked to the linear concentration of the gas and the temperature difference between the background and the gas. It is therefore possible to identify and to measure remotely, without any other specific equipment on site, the evolution of this linear concentration.

Remote detection, **identification**, **quantification**, **localisation** and the **visualisation** of gas chemical products, are essential needs in a number of industrial markets. Hyperspectral imagery offers incomparable capabilities to answer the needs of these different markets.

Infrared to see the invisible

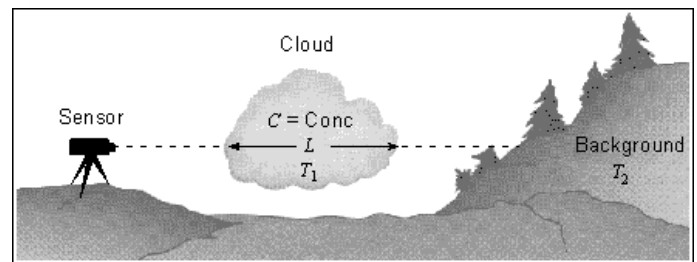


Passive technology

The ATIS 2.0 technology provides a decisive advantage over classical remote detection methods.

The passive chemical analysis method relies on the difference in emission and absorption of the different chemical products that can be seen by the instrument. If the gas is hotter than the observed area background, the spectral emission bands, unique to the gas, appears in the data acquired. These same bands are absorption bands if the gas is colder than the background.

Typical remote sensing monitoring set up

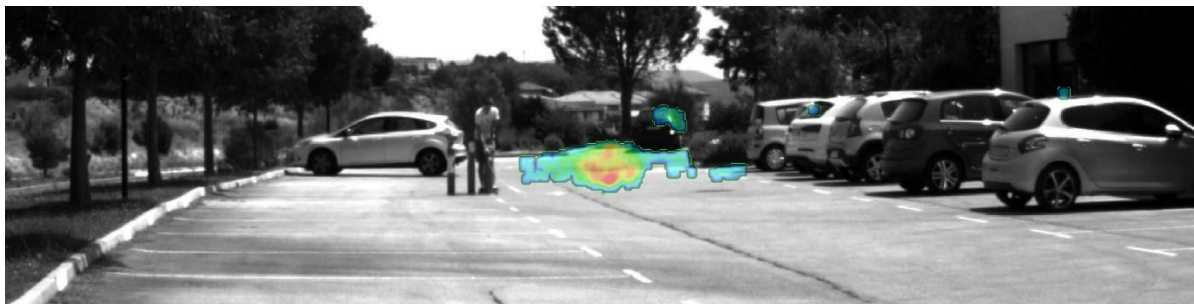


where C is the Concentration of the gas, L is the Length of the gas cloud, T_1 temperature of the gas, T_2 the temperature of the background

The spectral measurement of the energy received, emitted and reflected in the infrared region of the electromagnetic spectrum reveals signatures due to the vibrational transitions that are characteristic of a molecule.

Scene background

SPIM technology is able to detect gas cloud without removing scene background.



Advantages

WIDE FIELD OF VIEW

- Up to 60°x12° panorama field of view
- Up to 5km detection capability

EASY DEPLOYMENT

- By only 1 person
- Warm up time < 2min
- 24h /7 surveillance
- Working on battery

POWERFUL SOFTWARE

- Capacity to visualise the gas cloud on visible/infrared image
- Simultaneous detection of different kinds of gases
- Capacity to automatically generate alarms on gas detections

USER FRIENDLY

- Easy to select gas in database
- Capacity to add new gas very easily

LOW MAINTENANCE

- Once a year

SPIM products

Knowing that different gases are detectable in different infrared bands Long Wave Infra Red (LWIR) band and the Medium Wave Infra Red (MWIR) band, ATIS 2.0 has developed different cameras able to cover most of the gas detections required.

Knowing that different gases are detectable in different infrared bands, ATIS 2.0 has developed different cameras able to cover most of the gas detections required. SPIM exists under different versions:

- SPIM LWIR from 8 to 12 μm
- SPIM MWIR from 3 to 5 μm
- AeroSPIM (an airborne solution)



Furthermore, the SPIM systems are completely scalable as they are able to detect any gas that absorbs energy in the given LWIR or MWIR band. The gas data base is therefore unlimited, and when monitoring an area for gases it is possible to look for many different gases at a time.



SPIM LW



SPIM MW

SPIM Characteristics

	SPIM Uncooled LW	SPIM Cooled LW	SPIM Cooled MW
Spectral Range	7.8µm – 11.7µm	7.8µm – 11µm	3µm – 5.3µm
Spectral Resolution	40nm to 120 nm	40nm to 120nm	40nm to 120nm
Max FOV (tunable)	60 x 8°	60°x8°	60°x12°
Detector	Bolometer	Cooled MCT	Cooled MCT
Array	Uncooled 640x480	Cooled 320x240	Cooled 640x512
Size	50 x 26 x 23 cm	54 x 46 x 19 cm	48 x 30 x 23 cm
Weight	16 kg	16kg	16kg
Case Size	88 x 63 x 35 cm	88 x 63 x 35 cm	88 x 63 x 35 cm
Case Weight	40 kg	40kg	40kg
NESR (mW/m²/sr/µm)	< 50 @10µm	< 1 @8,66µm	< 1 @4,65µm
NETD (mK)	< 100	< 10	< 20
Acquisition Time	< 5sec	< 5sec	< 5sec
Interconnection câble	Ethernet	Ethernet	Ethernet
Input Voltage:	8-30VDC or 220VAC	24VDC or 220VAC	24VDC or 220VAC
Power :	<100W	<300W	<300W