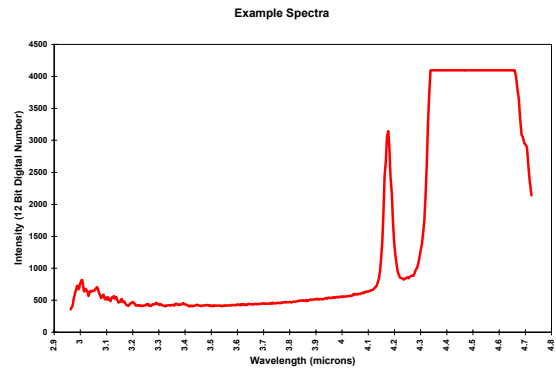




# Infrared Hyperspectral Imaging Using Image Multispectral Sensing IMSS

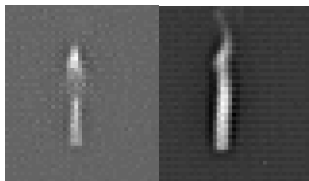
*Pacific Advanced Technology*

The IMSS instrument is a dispersive type hyper-spectral imaging spectrometer which uses a new and innovative patented approach invented by Pacific Advanced Technology (PAT). This technology provides a very rugged, portable infrared imaging spectrometer with hyper-spectral resolutions on the order of 0.01  $\mu\text{m}$ . PAT offers two models of the IMSS infrared hyper-spectral imaging-camera systems. The longwave system uses an f/1.8 diffractive lens with a nominal focal length of 75 mm, and the midwave system uses a f/2.5 diffractive lens with a 102mm focal length. PAT has developed these IMSS lens systems to mate with numerous infrared cameras. Because of the robust, lightweight and compact nature of the IMSS hyper-spectral imager lens system, it can easily be used on airborne platforms for multiple applications such as collection of signatures of targets and backgrounds, threat warning, surveillance, clutter rejection, target identification, pollution monitoring and drug interdiction.



## ABOUT THE TECHNOLOGY

The IMSS exploits advanced technology in diffractive optics and image signal processing. It images a scene and measures the spectral and radiometric content of all objects within the scene. Since it can measure the ratio of fuel-gas mixtures from hydrocarbon-burning fuels, the device is especially appropriate for emission monitoring. While other spectral imaging devices have complex optics and alignment requirements, the PAT IMSS uses a simple optical design eliminating complex alignment requirements. PAT also has a visible version of the hyperspectral camera system.



*Butane flame spectra for two fuel-air mixture ratio conditions as measured using the IMSS instrument. Spectral images of butane flame, a) for a spectral bin centered at 3.40  $\mu\text{m}$ , b) spectral bin centered at 4.57  $\mu\text{m}$ .*

### MID WAVE IR IMSS

Spectral Range	3.0 to 5.0 $\mu\text{m}$
Nominal Spectral Resolution	0.25% $\Delta\lambda/\lambda$ (0.01 $\mu\text{m}$ at 4 $\mu\text{m}$ )
F number	f/2.5 at 4 $\mu\text{m}$
Focal Length	102 mm at 4 $\mu\text{m}$

### LONG WAVE IR IMSS

Spectral Range	8.0 to 11.0 $\mu\text{m}$
Nominal Spectral Resolution	0.25% $\Delta\lambda/\lambda$ (0.01 $\mu\text{m}$ at 9 $\mu\text{m}$ )
F number	f/1.8 @ 9 $\mu\text{m}$
Focal Length	75mm at 9 $\mu\text{m}$

# PAT

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