



### THE IDS3102-InSb MWIR IRFPA SYSTEM

The IDS3102 IRFPA Imager System consists of the LN<sub>2</sub> pour-fill cryostat, rear-mounted electronics assembly, and external power supply. The system is intended to serve as a development tool for engineers and scientists interested in evaluating sensors or developing IRFPA applications. The system also serves as a standalone IRFPA camera system for dedicated installations, using the p1394a (FireWire™) interface available on many computers. For spectrometer applications, the system can utilize the Talktronics DTSpec Imaging Spectrometer system software and external user-defined optics for a complete spectrometer system.

The electronics module contains the digital timing controller that generates all clock signals and bias voltages for the IRFPA, digitizes the pixels and sends the digitized pixel information to a computer (PC or other) via the p1394a (FireWire™) Digital Camera Interface.

The IRFPA is a MWIR InSb focal plane array, with 30x30 μm pixels in 320x256 format. The sensor is a staring type device, with adjustable gain and integration time. Sensitivity of the device spans 1-5 μm due to AR coating.

The electronics module can be controlled via software in the p1394a Camera Setup software control panel, or alternatively can be commanded via the RS232C serial port. Pixel correction is provided via two-point correction method, with a gain map downloaded via the RS232C serial port, and stored in the camera while power is maintained. The Camera Setup software provides global control of analog gain (via FPA), digital gain (via pixel processor), offset, automatic background subtraction mode, integration time and image capture functions. A trigger output is provided for synchronizing external hardware (TTL pulse).

The IDS3102 IRFPA Camera Dewar and electronics assembly may be remotely located from the PC (standard cable is 6 feet), and the power supply (6 ft. cable).

### LN<sub>2</sub> CRYOSTAT

The IRFPA sensor is enclosed in an LN<sub>2</sub>-cooled Cryostat. Breakdown of the Cryostat for access to the device is simplified, suitable for rapid disassembly for test purposes.

Cool-down time from room temperature to <80° K is typically about thirty-five minutes. Hold time with <100 mW device heat load is greater than 15 hours.

The window is nominally 50mm X 3mm, and is replaceable. The standard window supplied for MWIR applications is A/R coated CaF. A/R coated ZnSe is available as an option. Provision is made in the cold shield and sensor clamp for a standard-sized (25 mm) "cold filter" (not included, optional order item).

Automatic LN<sub>2</sub> filling kits are available that include an LN<sub>2</sub> transfer line, valve, and thermal controller for use with pressurized LN<sub>2</sub> storage vessels.

## IDS-3102-InSb IRFPA CAMERA SYSTEM SPECIFICATIONS

IRFPA	Material	InSb	Camera Control	
	Format	320x256 nominal	P1394a Interface	• Input Offset (DAC)
	Pixel size	30x30 um	Software Controls	• ADC Offset (DAC)
	ROIC noise	< 300 uV		• Brightness
	ROIC output voltage range	2 V typ		• Contrast
	Spectral response	7.5 – 10.5 um (measured)		• Global Digital Gain
	QE	2 – 10.5 um typical		• Background collection
	Capacity	>20 Me-		• Integration time
FPA Signal Processing				
	Preamp	2 channels		
	Gain Adjustment	TBD	RS232C Interface	All of above, plus:
ADC				• Debug features
	Resolution	Dual 14 bits		• RAM test
	Sample Rate	2 MHz		• Temperature Display
	SNR	>70 dB		• Gain map calibration
	INL	± 1 LSB		• Gain map upload/download
	DNL	± 3/4 LSB		• Image RAM download
	Noise	< 1 DN, input shorted		
	Non-uniformity correction	Per-pixel DC offset		
		Per-pixel gain		
	Input signal range	± 1.25V	Power Supply (External)	
			Input	85 – 240 VAC
System				50/60 Hz
	Analog Gain, per channel	1.5 to 150 V/V (fixed resistors)	Power Consumption	200 VA
	Digital Gain	0.5 to 2	Size	12x8x3 inches
	Sensitivity	3 uV min	Weight	5 lbs
	Noise	< 5 DN rms at 2 MHz	LN2 Dewar (including electronics)	
	Integration control	<100 usec to 16 msec typ	Size	12"x8"x13" HxWxD
	Background subtraction	Performed in real time	Weight	30x20x33 cm
	Gain correction	Performed in real time	Vacuum port	20 lbs
	Frame buffer	Dual image buffer		Cryolab SV8
	Pixel clock rate	1 – 2 MHz typ		ISO DN16 flange
	Frame rate	15 fps typical	LN2 capacity	or 1/2" tube
				1 liter
Interface				
	P1394a (FireWire)	6 pin (power not used)		
	RS232C	9 pin "D"		
Software				
	P1394a Image Capture	Image capture to disk ".avi" movie or ".bmp" snapshot files		

FireWire™ is a trademark of Apple Computer

Talktronics, Inc.  
23400 Peralta Drive, Suite D  
Laguna Hills, CA 92653 USA

(949) 215-2903  
FAX (949) 215-2913  
www.talktronics.com