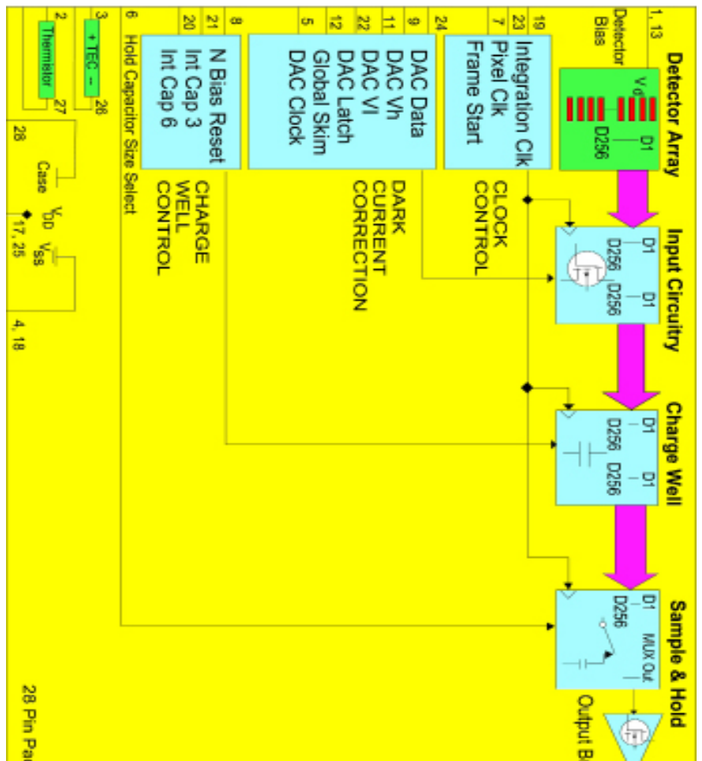
Cal Sensors 256 Element Multiplexed Array
Functional Diagram



USB Interface Board Features & Specifications

- USB interface to controller
  - Can be controlled by software commands with supplied driver
- Simple command structure interface
- On-board microcontroller controls all multiplexed array functions
  - Cooler control to set point temperature
  - All multiplexed timing and control voltages
  - Detector bias voltage
  - A/D converter control
  - Storage of all control and correction coefficients in non-volatile memory
  - Automatic reload at power-up
- 16 bit A/D conveter at 500k samples/sec
- Efficient, high current PWM cooler drive FET requires no additional heatsinking
  - Synchronization with A/D conversion ensures low noise
- Simple power requirements
  - 12V@100mA
  - 4 to 6 volts @1.5A
- Small size: 2.1” x 1.4” x 0.4”
- Direct interface to standard 28 pin package

Contact Information:

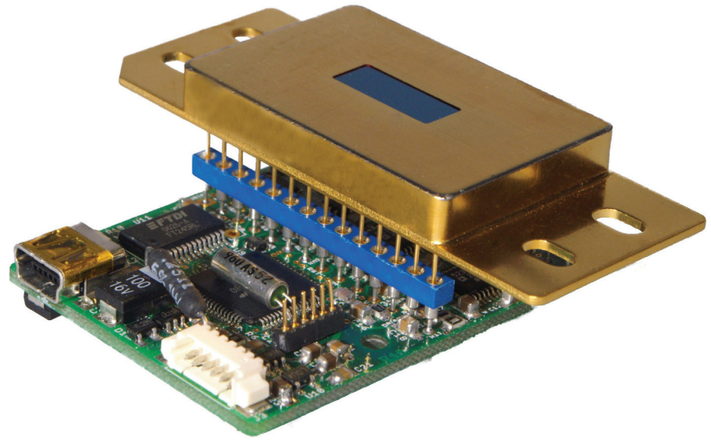
Headquarters and Worldwide Sales:

5460 Skylane Blvd.,
Santa Rosa, CA 95403
Ph. 707-545-4181
Fx. 707-545-5113
E.mail: info@calsensors.com

Visit our website... www.calsensors.com

Our Sales Representative Near You:

256 ELEMENT MULTIPLEXED ARRAYS FOR SPECTROSCOPY



Lead Selenide (PbSe)
Lead Sulfide (PbS)

CalSensors

PbS and PbSe Multiplexed Array Features:

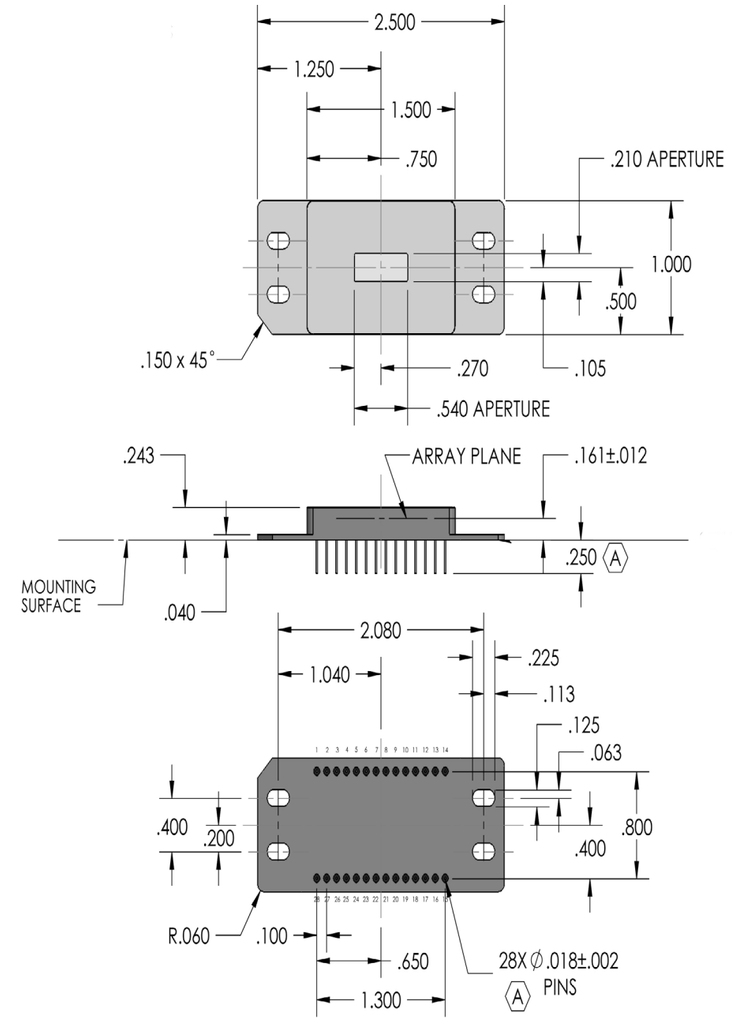
- The low profile package features a detector with high aspect ratio pixels on 50 micron centers.
- The internal electronics provide variable integration and dark current correction.
- Temperature stabilization is achieved using an internal thermoelectric cooler and thermistor.
- This product is designed for low cost spectroscopic applications in the 1 to 5 micron wavelength region for PbSe and 1 to 3 microns for PbS.
- The internal multiplexer includes a serial readout up to 4 MHz and a global plus 8 bit per pixel dark current correction.
- Signal integration is variable with adjustable well size and can be generated before or during readout.
- The array package is supplied with a compact USB controller board (optional) for easy computer interface.
- Multiplexed arrays installed into spectrometers have proven to be reliable and are cost effective alternatives to InGaAs detector material.
- Can be supplied as a development system.

256 Element PbSe Multiplexed Array Performance

Parameter:	Typical Performance:
Operating Wavelength Range:	1 to 5 Microns
Number of Elements:	256 detector elements
Element Size:	Pixel width 40 microns, pixel height 450 microns, and pixel pitch 50 microns
Peak Detectivity:	D* : 1.0 x10^{10} (cmHz ^0.5/W^{-1})
Resistance Uniformity (pixel-to-pixel):	±15% of array signal mean
Integration Range:	.01mS to 200mS (on board)
Pixel Clock:	2MHz max. for 4MHz data output
Linearity:	90%
Pixel Operability:	98% minimum
Detector Rise Time:	<10µS
Input Power Requirement:	7 VDC mux, 8VDC cooler 1.7A max

256 Element PbS Multiplexed Array Performance

Parameter:	Typical Performance:
Operating Wavelength Range:	1 to 3 Microns
Number of Elements:	256 detector elements
Element Size:	Pixel width 40 microns, pixel height 450 microns, and pixel pitch 50 microns
Peak Detectivity:	D* : 1.0 x10^{11} (cmHz ^0.5/W^{-1})
Resistance Uniformity (pixel-to-pixel):	±10% of array signal mean
Integration Range:	.01 mS to 200mS (on board)
Pixel Clock:	2MHz max. for 4MHz data output
Linearity:	90%
Pixel Operability:	98% minimum
Detector Rise Time:	<1mS
Input Power Requirement:	7 VDC mux, 8VDC cooler 1.7A max



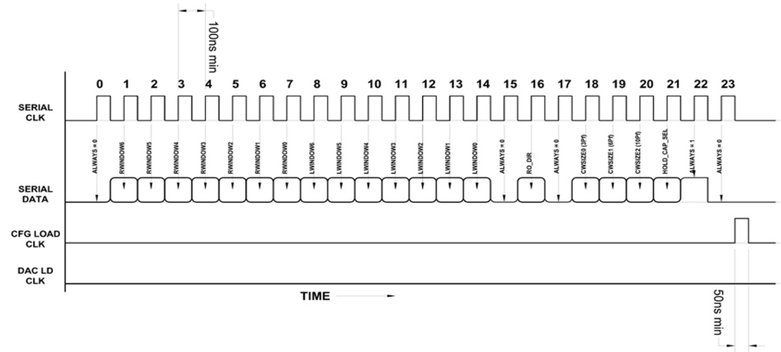
PIN # FUNCTION

1 DETECTOR BIAS	10 MUX OUT	19 INT CLK
2 THERMISTOR A	11 DAC Vl	20 NC
3 TEC (+)	12 GLOBAL SKIM	21 NC
4 NC	13 DET BIAS	22 DAC LOAD CLK
5 SERIAL CLK	14 NO CONNECTION	23 PIXEL CLK
6 CFG LOAD CLK	15 NO CONNECTION	24 SERIAL DATA
7 FRAME START	16 NO CONNECTION	25 NC
8 N BIAS RST	17 Vdd	26 TEC (-)
9 DAC Vh	18 Vss	27 THERMISTOR B
		28 CASE

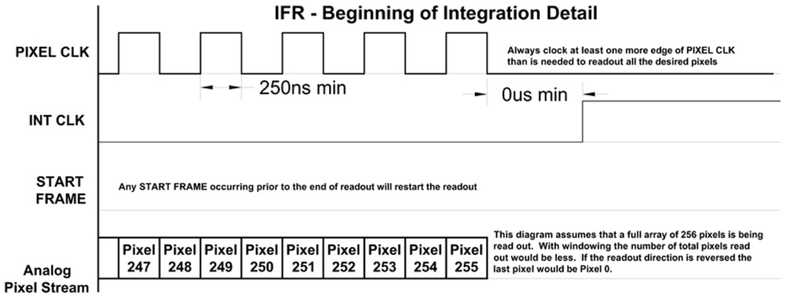
See website for descriptions of pin functions.

System Timing Diagrams

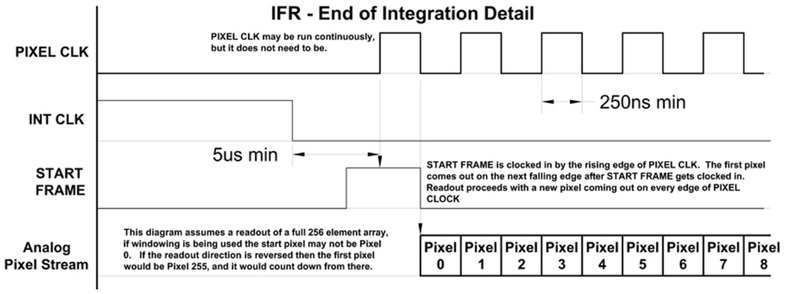
Serial Control Register Timing Diagram



IFR - Beginning of Integration Detail



IFR - End of Integration Detail



IWR - Integration Detail