

1300 Series Camera



Overview

Spectral Instruments' 1300 Series camera utilizes the world's largest CCD. The 10k X 10k 9 μ m pixel sensor utilizes 16 ports for fast acquisition even with moderate read speeds for the lowest noise measurements. Cryogenic cooling to -100°C nearly eliminates dark current for the longest exposures possible. Communication from the computer to the camera head is possible from great distances through Spectral Instruments proprietary fiber optic PCI data interface. The small cross section of the camera head lends itself to applications where size is restricted, but maximum imaging area is a requirement. The 1300S accomplishes this goal without the complexity and high cost of multi-CCD mosaic systems.



Key Features

- World's largest single CCD sensor boasting the largest number of pixels available on a single chip
- Simultaneous read-out from 16 ports
- 16-bit digitization at up to 1MHz read rates with $4e^{-}$ read noise at 100kHz
- Cryogenic cooling keeps the CCD at a constant -100°C +/- 0.1°C and virtually eliminates dark current
- Front or back-illuminated versions available
- FITS file format with customizable headers

Example Applications

- Back illuminated versions form a perfect coupling to telescopes performing wide field imaging
- High energy physics
- Medical imaging
- Applications requiring a maximum area from a single sensor

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CCD Sensor

16 ports allow maximum data rates to be reached with this sensor despite its large size. More than 110 megapixels can be read in less than 10 seconds with less than $10e^{-}$ noise. 16-bit digitization captures the full dynamic range of the $80,000e^{-}$ per pixel dynamic range.

Camera Size

Considering the size of the sensor in the 1300S camera, the body is roughly a cylinder 8" in diameter by 12" in length. Bolt patterns at the head can be customized for the end-use application. Shown below is the rack mount containing the cryo-tiger and power supply.

CCD Cooling

Cryogenic cooling via closed-cycle refrigeration units allow the CCD to be held at -100°C . The near elimination of dark current allows for zero background imaging with very long exposures.

Data Interface

The proprietary gigabit fiber optic interface to the 1300S camera allows for fast communication and data download from the camera to the host computer utilizing a free PCI express slot. The flexibility of this interface allows the camera head to be located many meters away from the controlling PC.

Software Interface

Spectral Instruments provides our own SI Image SGL camera control software that uses an intuitive graphical user interface for camera control, image acquisition, viewing, processing and archiving. In addition, a TCP/IP server is built into the software allowing another program on the same computer or from another computer to initiate image acquisition and transfer. SI Image SGL is written in LabVIEW and is provided as a Windows application. LabVIEW and C++ SDK packages are available as an option for users who need to extend its functionality or incorporate controlling other instruments into a single program.

