SBIG
ASTRONOMICAL INSTRUMENTS
a division of Aplegen, Inc.

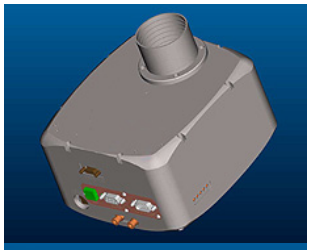
STL-11000M and STL-11000CM

Large Format, Dual Head, Triple Sensor, Self-Guiding CCD Cameras

The Research Line of cameras is an all new camera design that has been over two years in the making. Our design team has combined the best features and ideas from past designs and updated our current high speed electronics and USB interface to handle these large format CCDs (up to 35mm format with 11 megapixels). New features include a dual head self-guiding option, simplified power requirements and an internal 2" filter wheel for overall system cost and weight reduction. These large format cameras are designed to offer more features at a lower price than other previously available cameras. Our goal was to produce a high performance imaging system that included large area detectors, flexible self-guiding options and a large format filter wheel all at a lower price than competing cameras alone. We believe we have achieved that goal.

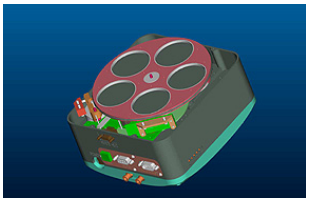
Features

Dual Head, Triple Sensor, Self-Guiding



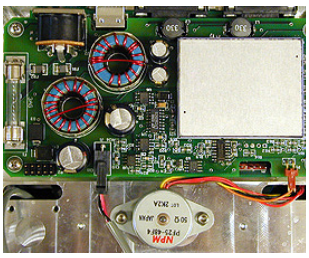
The best of both worlds. We have expanded the self-guiding capabilities in the Research cameras by adding the option of a remote guiding head. With the remote guiding head attached, there are two, software selectable, TC-237 CCDs available for self-guiding under any conditions in addition to the main imaging CCD. One guiding CCD is located next to the imaging CCD in our patented design, similar to the self-guiding arrangement in our ST line of cameras. The remote guiding CCD is in a small separate head that attaches to the main camera body by a short cable. There is no separate power supply or communication cable required. The remote head contains its own TE cooler and shutter. With the optional remote guiding head attached to the main camera body, self-guiding is accomplished by selecting either the internal TC-237 tracking CCD or the remote TC237 CCD using the camera control software. The benefits of this flexibility are obvious. Internal guiding eliminates the need for a guide scope and separate autoguider. It also eliminates the problem of differential deflection of the guide scope or differential motion of the primary mirror relative to the guide scope. However, some users prefer to use an external guider when imaging through dark infrared band or narrow band filters, or for RGB color imaging in regions of the sky with sparse guide stars. The remote guiding head may be used in an off-axis guiding accessory or attached to a separate guide scope. There is only one small cable between the remote head and the main camera body. The remote head can be left connected and the user may freely switch between the internal or the remote TC-237 for self-guiding. All the guiding functions are controlled by the same camera software that normally controls the internal guider.

Internal 2" Filter Carousel



An internal 5 position 2" filter carousel is integrated into the front cover of the camera body. For color, UBVRI, or narrow band imaging simply add filters to the camera's carousel. There is no expensive separate 2" filter wheel to purchase. The filter carousel accepts both 50mm diameter flats and 48mm threaded filter cells. The front cover of the camera is easily removed for changing filters. Since the CCD is in a separate sealed chamber, removal of the front cover to change filters does not expose the CCD to dust or air and the desiccant does not need to be recharged after replacing the cover. Extra carousels may be purchased for quick and easy transition between filter sets. A shutter mechanism is also located inside the camera body, between the filter wheel and the sealed CCD chamber. A custom LRGBC filters set is optional.

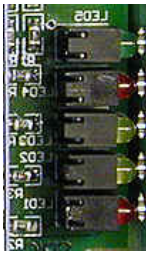
12VDC Operation



We have added an internal 12VDC regulated power supply to the camera for simplified power requirements and greater tolerance of input voltage variation. When operating in the field from a 12V battery, current drain, power cord extensions and

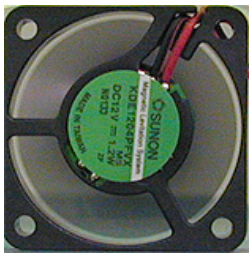
cold temperatures may cause the input voltage to drop below 12 volts. The internal regulated supply will accommodate some variation in input voltage (from about 10 volts to 18 volts) and keep the camera operating normally. This will allow for longer power cords to be used with less concern for voltage drops so long as the input voltage stays within a certain range. A set of indicator LEDs will let you know if your input voltage at the camera is getting too low for normal operation. A universal 110VAC-220VAC to 12VDC power supply is also included for operation from virtually any line voltage in the world.

Intelligent



A set of five LED indicator lights on the side panel of the camera provide critical camera status information. The green LED lets you know the camera is booting up and gives camera exposure status during normal operation. One red LED provides a warning if the heat sink gets too hot. This could happen, for instance, if you were running high power to the cooler and the fan failed for some reason. In this case the camera automatically reduces power to the two-stage cooler to prevent damage. One amber LED warns of an input voltage drop to 11 volts or less but the camera will continue functioning normally. The second amber LED warns of an input voltage drop to 10 volts but the camera will still continue functioning normally. The last red LED warns of an input voltage drop to 9 volts or less. In this case, the camera automatically turns off the TE cooler and continues to operate normally without cooling until the voltage drops to the point that the camera shuts down (around < 7 volts).

Two Stage Cooling with Water Assist

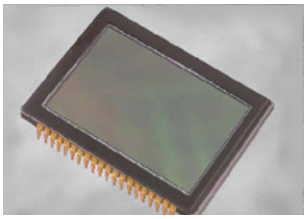


The standard cooling design utilizes a very efficient two-stage TE cooler for maximum performance with large format detectors. Each camera is also liquid assist ready so that additional cooling in warm climates may be achieved by circulating water if needed. We are currently testing a special magnetic levitating fan to eliminate even the smallest vibration. Typical performance tests show that cooling to -40 Degrees C below ambient will be achieved with this system using ambient temperature water. Greater cooling may be achieved with water cooled to just above the dew point.

Deluxe Accommodations

Every Research Model camera will be shipped in a custom fitted Pelican brand carrying case for superior protection of your equipment. These cases are waterproof, dustproof, crushproof and have a lifetime guarantee from the manufacturer. Each Pelican case has an automatic pressure relief valve and double hinged latches for easier opening. There is ample room inside for the camera, cables, wall transformer and some accessories in the custom cut foam insert. An optional lid pocket is available from Pelican that will hold charts and manuals.

The Research



Astrophotographers take note: A 35mm format CCD with 11 million pixels. Another revolution in astrophotography is about to take place. If you have been waiting for a wide field CCD with the same coverage as 35mm film, here it is. Only this one is cooled, linear, self-guiding, 16 bits and optimized for high sensitivity and low noise performance in low light astronomical applications. No reciprocity failure here.

Based on the results we have seen with the ST-2000XCM Camera, we have added a color version of the STL-11000 camera. Click here to see the first light sample images taken with the STL-11000CM. Price for the Class 1 will be the same as the monochrome STL-11000M. A lower priced Class 2 device is available in color only.

Each Research Series camera includes

- STL camera body with TE cooled imaging CCD and built-in TE cooled tracking CCD
- Internal filter wheel (filters are optional)
- Custom 2” nosepiece
- Camera handles
- USB cable
- ST-L-RC Adapter plug and tracking cable
- Universal 100-240VAC power supply
- CCDOPS software
- CCDSoftV5 software
- TheSky version 5 software
- Hex wrench set
- Pelican carrying case with custom cut foam

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