

## STXL-11000 and STXL-6303

The new STXL camera is the latest version of the flagship STX series. The STXL is essentially the same camera design as the STX with three exceptions: First, the self-guiding CCD is moved from the main camera body to the new STXL filter wheel for guiding in front of filters; second, a rotating disk even-illumination shutter provides a shorter backfocus distance allowing the use of camera lenses; and third, the STXL uses the new STT remote guide head.

A new STXL filter wheel option accompanies the release of the STXL series camera. The 8-position STXL filter wheel is of a similar design as the STT filter wheel. It uses the same precise positioning mechanism, but accommodates both standard 50.8 mm round unmounted filters and 2" filters mounted in cells with 48mm threads. The self-guiding CCD is incorporated into the filter wheel, in front of the filters.



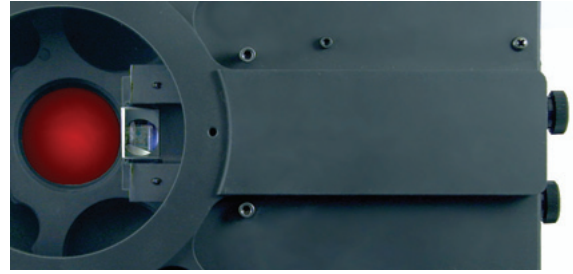
All of the other features of the STXL are the same as the STX series: Two-stage cooling to -60C, water cooling ready, ethernet and USB 2.0 computer interfaces, Several new innovations for serious imagers have been designed into this professional camera. To name a few:

- USB 2.0 and Ethernet in each camera
- Web browser control ready
- Two-Stage TE Cooling
- Minimum Cooling Delta -60 C with Air Only
- 12VDC operation (9-14VDC)
- Self-guiding in front of filters
- Full frame image buffer
- Continue guiding while downloading
- Internal and External Self-Guiding
- Optional Remote Guide Head
- Separate focus adjustment for built-in guider
- New photometric shutter for large arrays
- Variable speed fan
- Quick Disconnect Water Cooling Ready
- User Rechargeable Desiccant Plug
- Opto-isolated Relays for Telescope Control
- Tracking Relay LED Indicators
- Power Management LED Indicators

USB 2.0 and Ethernet are available on each STX camera. The user does not have to choose the interface at the time of purchase. One benefit of Ethernet is that there are no drivers to install and the camera can be controlled from a web page.

## Self-Guiding in Front of Filters

It is well known that the advantage of easier guiding through a separate guide scopes is often limited by differential deflection of the guide scope relative to the main optical axis due to mechanical flexure or shifting of the mirror in the main OTA. It was this difficulty that SBIG addressed with our patented self-guiding design, and that we and others have addressed with an



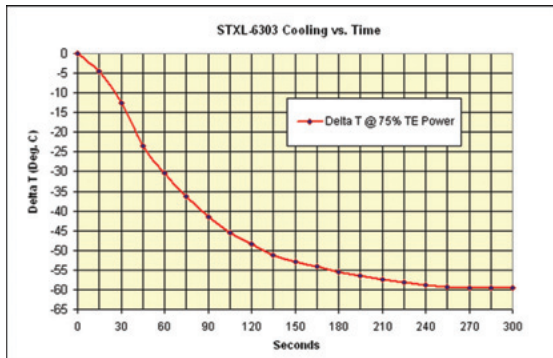
### Off-Axis Guiding

solution. Self-guiding is more convenient and more accurate, but can prove more difficult when narrowband filters are used. Previously, by piecing together an off-axis guiding system with parts from different manufacturers, users could place a guider in front of the filters, but this was generally more expensive, required additional equipment and did not always integrate well. Also, controlling two cameras might require one computer to run two instances of camera control software. The ideal solution was therefore to design a self-guiding system that placed the guiding CCD in front of the filters using an integrated design that is easy to control. That is the new filter wheel / guider design of the STT and STXL cameras. The guiding CCD is built into the filter wheel and connects directly to the main cameras

as an "external" tracking CCD. The optical design is optimized for guiding and all the commands and control of the guider are identical to those of our traditional self-guiding design. The guider does not require any power or control cables routed back to a computer and the system can be operated by a single software package as one camera.

## Superior Cooling:

The STXL uses an innovative pin fin heat sink. This design is the most efficient for dissipating heat per given volume, and while it is more expensive than typical parallel fin heat sinks commonly round



elsewhere, it provides superior performance and minimizes size and weight at the same time. This is



one of the reasons the STXL camera weighs less than competing cameras with similar cooling performance. The new heat sink is an optimized design for this camera using a large custom pin fin heat sink mated directly to the hot side of the 2 stage TE cooler to achieve maximum heat dissipation with a single large fan. In less than 5 minutes the STXL-11000

achieves a delta of -60C using air cooling only.

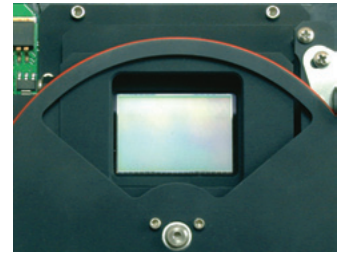
## Water Circulation Ready

While the design is aimed at sufficient cooling without water assist, it is possible to use water instead of air or in addition to air for optimum cooling. Using water instead of air will not require the use of a fan. Chilled water may also be used alone or with the fan for even greater cooling.

## Other STXL Features:

### Even-illumination Shutter

Like the STT and other SBIG cameras, this is a critical feature for anyone doing twilight flats or needing photometric quality flats for research. "Even-illumination" means that the shutter mechanism is designed to open and close in such a manner that it does not change the proportion of light falling on the sensor due to the shape or motion of the shutter itself. This is what one finds for instance with an iris type of shutter that opens-up starting at the center and closes over the center last.



### USB 2.0 and Ethernet Interface

The STXL series, like the STX and STT series cameras, has both USB 2.0 and Ethernet interface capability for the greatest versatility with a variety of computer systems. The Ethernet interface makes control of the camera over a network easy and less expensive than requiring a local computer to be controlled remotely. Moreover, the camera has a built-in web server. Also, with Ethernet, no camera drivers need to be installed.



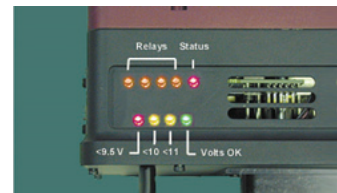
### Optional Remote Guide Head

The STXL camera uses the same remote guide head as the STT series camera. This remote guider is essentially a special version of the ST-i camera using a KAI-0340 CCD that can be controlled directly from the STT or STXL camera without routing any power or USB cable back to the computer. Operating the remote guide head is the same as operating an internal self-guiding CCD using CCDOPS or other camera control software. A separate instance of camera control software does not need to be run.



### Tracking Relay and Power Management LED indicators

This handy set of LEDs will tell you at a glance if the camera is issuing corrections to the mount in +X, -X, +Y or -Y directions during an imaging session. Also, power LEDs indicate if the supply voltage drops to 11, 10 or 9 volts and when it is "good." Operation of the camera is possible with an unregulated supply voltage of 9.1 to 14 volts DC (battery).



### Variable Speed Fan

If the user desires air cooling only, the fan speed is controllable through software. Variable speed control allows the user to "tune" to fan to eliminate any resonance with the user's telescope thus suppressing harmonic vibrations.

