



STT-1603ME and STT-3200ME

High QE Camera Systems



What makes the STT-1603ME and STT-3200ME so desirable?

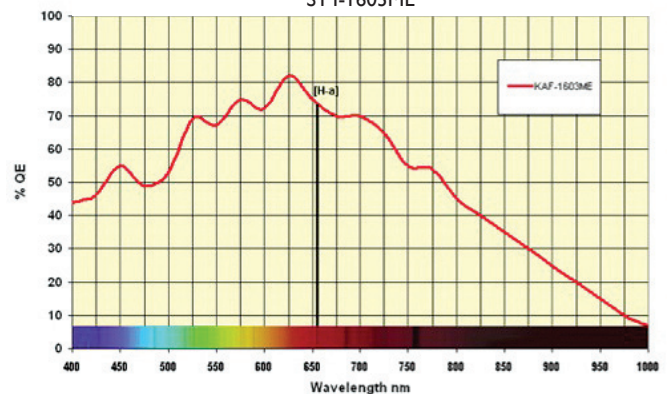
They have all the same extraordinary features of the STT-8300:

- Camera, Autoguider, and Filter Wheel fully integrated with guiding CCD in front of the filters! No separate guider required!
- New MicronPrecision filter wheel provides unmatched flat field accuracy for high end imaging and high precision photometry!
- Lightning fast downloads < 1 second full-frame!
- Superior two-stage cooling to -55 deg C ambient with air only!
- Built-in frost detection!
- User Selectable Internal Image Processing!
- USB 2.0 and Ethernet connectivity for remote observatories!
- **Plus:** The Highest Quantum Efficiency of any front illuminated CCDs available to amateurs, 75% and 85% at the important emission line of H-alpha!

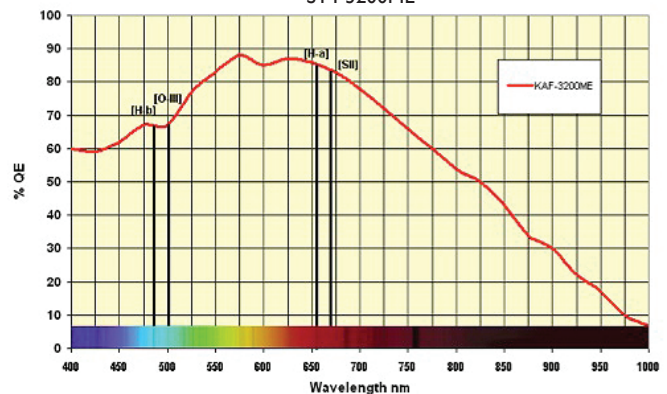
STT Camera Series Highlights

- Self-Guiding in Front of filters
- Lowest Noise 10Mhz Readout < 1 sec
- High Precision 8-position Filter Wheel
- User Selectable Internal Image Processing
- Built-in Frost Detection
- 2-Stage TE Cooling -55C delta T with air
- Built-in Web Server
- Full Frame Image Buffer
- Even-illumination (photometric) shutter
- Ethernet and USB 2.0
- Built-in RBI Pre-flash
- Liquid Cooling Capability Standard
- Twin Variable Speed Fans
- Multi-coated Sapphire Chamber Window
- Accepts 1.25", 31mm and 36mm filters
- User Rechargeable Desiccant Plug
- High Accuracy Temperature Control
- External Triggers In / Out
- Status, Power and Relay Indicators
- Windows 32-bit and 64-bit (and Mac) Software
- Optional Remote Guide Head
- Optional Adaptive Optics (AO-8)
- Power Management System
- 12VDC Operation

Quantum Efficiency
STT-1603ME

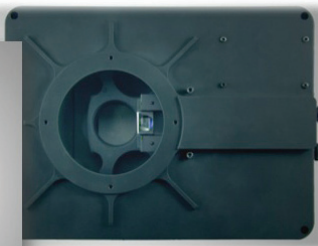


Quantum Efficiency
STT-3200ME



The Products

STT Series Camera System



Micron-Precision Filter Wheel
with Built-in Self-Guiding CCD

The Camera: No Compromises

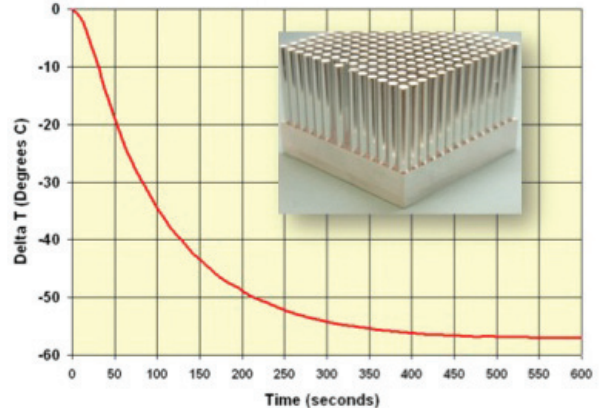
The STT Series is a new design with everything the astroimager could want in a camera:

- Fast, low noise digitization and a full frame image buffer. At 10MHz the STT downloads a full frame, low-noise 8300 frame in less than a second.
- Superior two-stage cooling to -55°C below ambient with air only. Its also water cooling-ready for additional cooling without having to buy a replacement back plate or other additional accessory. Its ready to go out of the box.
- A multitude of advanced features such as built-in frost detection, RBI pre-flash, power management system, ethernet and USB 2.0, high accuracy temperature control, sapphire window, and user selectable internal image processing put this camera in a league of its own. No other astro camera has these features, at any price.

The STT uses the same efficient pin fin heat sink design as the STX series cameras to achieve the most efficient use of space and weight while maximizing the cooling capability of the camera. This type of heat sink is more expensive than typical parallel fin heat sinks, but the results speak for themselves. The STT prototypes achieved an average temperature delta greater than -50°C in 5 minutes and a max of -57°C in less than ten.



STT-8300 Cooling Performance



The Camera: Even-Illumination Shutter

- Since its founding, SBIG's mechanical shutters have been designed for highly reliable, even-illumination, of the sensor even at short exposures.
- Even-illumination is especially critical when taking flat fields with exposures of less than a second or even several seconds.
- Very common when taking sky flats.



Twilight Flat from Iris/
Leaf shutter



Twilight Flat from SBIG
Even-Illumination
Shutter



The Camera: Internal Image Processing

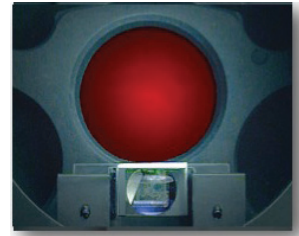
SBIG's new STT-8300, the first high speed 8300 camera with user-selectable automatic image processing! These 30 second dark frames were taken at room temperature to accentuate the number of warm pixels. The first frame is unprocessed, the second frame has a medium filter, and the third frame the most aggressive filter.

Each shows fewer bright pixels and each has correspondingly lower noise in the image. The user can select from eight levels of filter strength to suit his needs.

The Filter Wheel: Self-Guiding Up Front

Self-Guiding in Front of the Filters:

Self-guiding has long been acknowledged as the best, most accurate way to guide long exposure astrophotos, particularly with commercial SCTs. The single most common complaint however is finding bright stars when guiding through dark or narrowband filters. The STT filter wheel incorporates the self-guiding CCD inside the front cover of the filter wheel so that the guider picks off light from the guide stars before passing through the filters. There are two adjustment knobs on the filter wheel base: one for focus and one for moving the pick-off mirror. Problem solved.



The Filter Wheel: Precise Flats Solved

Micron-Precision Filter Positioning:

When taking flat field frames of filtered images, the flat field frame must show exactly the same optical characteristics to be the most effective. If there is dust on the filter, or uneven illumination caused by the filter, this must be represented precisely as seen in the light image to be corrected by the flat field frame. The STT filter wheel is designed to provide a new level of accuracy when taking flats through filters by repositioning filters to within a few microns every time. This allows the imager to take extremely accurate flat field frames even after rotating the filter wheel several times, or even after a loss of power.



Note: *The STT-3200ME and STT-1603ME require only 1.25" filters to fully illuminate the sensor. Inserts are available for the STT Filter Wheels allowing the use of 1.25" LRGB, Narrowband and Photometric filters.*

STT-1603ME

- I. Basic Camera: STT-1603ME Camera with KAF-1603-C2 CCD, Universal Power Supply, USB Cable, Tracking Cable, 2" t-thread nosepiece and Software (Part # STT-1603ME)

STT-3200ME

- I. Basic Camera: STT-3200ME Camera with KAF-3200-C2 CCD, Universal Power Supply, USB Cable, Tracking Cable, 2" t-thread nosepiece and Software (Part # STT-3200ME)

STT-1603ME Typical Specifications

CCD	Kodak KAF-1603ME
Pixel Array	1536 x 1024 pixels @ 9u
CCD Size	13.8 x 9.2 mm
Total Pixels	1.6 million
Full Well Capacity	100,000 e-
Dark Current	0.1e-/pixel/sec at -20C
Antiblooming	NABG only
Shutter	Mechanical, Even-illumination
Exposure	0.12 to 3600 seconds, 10ms
Correlated Double Sampling	Yes
A/D Converter	16 bits
Gain	2.3e-/ADU
Read Noise	<15e- rms
Quantum Efficiency	~85% Peak, ~75% at H-a
Binning Modes	1x1, 2x2, 3x3, 9x9, x n
Digitization Rate	10 Megapixels per second
Full Frame Download	< 1 second
Max Cooling Delta	-55C with air only
Temp. Regulation	±0.1°C
Power	12VDC at 3.5 amps
Interface	USB 2.0 and Ethernet
Computer Compatibility	• Windows 32 / 64 bit • Mac OSX • 3rd party Linux
Camera Body Size	4.9 x 4.9 x 2.9 in. / 124 x 124 x 74 mm
Mounting	T-Thread, 2" nosepiece
Weight	2.7 pounds / 1.2 kg
Backfocus	0.69 inches / 17.5 mm

STT-3200ME Typical Specifications

CCD	Kodak KAF-3200ME
Pixel Array	2184 x 1510 pixels @ 6.8u
CCD Size	14.85 x 10.26 mm
Total Pixels	3.2 million
Full Well Capacity	55,000 e-
Dark Current	0.06e-/pixel/sec at -20C
Antiblooming	NABG only
Shutter	Mechanical, Even-illumination
Exposure	0.12 to 3600 seconds, 10ms
Correlated Double Sampling	Yes
A/D Converter	16 bits
Gain	2.3e-/ADU
Read Noise	~10e- rms
Quantum Efficiency	~90% Peak, ~85% at H-a
Binning Modes	1x1, 2x2, 3x3, 9x9, x n
Digitization Rate	8.33 Megapixels per second
Full Frame Download	< 1 second
Max Cooling Delta	-55C with air only
Temp. Regulation	±0.1°C
Power	12VDC at 3.5 amps
Interface	USB 2.0 and Ethernet
Computer Compatibility	• Windows 32 / 64 bit • Mac OSX • 3rd party Linux
Camera Body Size	4.9 x 4.9 x 2.9 in. / 124 x 124 x 74 mm
Mounting	T-Thread, 2" nosepiece
Weight	2.7 pounds / 1.2 kg
Backfocus	0.69 inches / 17.5 mm

Mechanical back focus of the STT with FW8S-STT Standard Filter Wheel is 36.2 mm, and with FW8G-STT Self-Guiding Filter Wheel it is 54 mm. Optical back focus will be a few mm less depending on the thickness of the filter used.



Product Components

STT-3200ME and STT-1603ME cameras include:

Rugged, aluminum body with Ethernet and USB 2.0 electronics, Even-illumination shutter, two-stage TE cooling, water cooling ready, USB and Tracking Cables, Power supply, CCDOPS, carrying case.

Every STT-1603ME and STT-3200ME, whether sold separately or as part of a kit, includes:

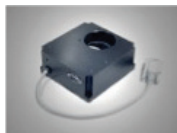
- Class 2 CCD
- Rugged machined camera body with rack handles and 2" nosepiece
- Internal, even-illumination, mechanical shutter
- 15 foot USB cable (third party USB extenders available)
- Telescope interface cable (for guiding)
- Universal 100-240VAC 6A Power supply
- SBIG's CCDOPS version 5 camera control software
- Custom case with pre-cut foam for camera and small accessories
- Two Year Warranty Parts and Labor on the camera other than the CCD
- One Year Warranty Parts and Labor on the CCD
- Demo CD-ROM with sample images and software

Optional STT Filter Wheel Options

- **FW8S-STT Precise Positioning Filter Wheel with standard cover plate**
- 8-Position, 36mm carousel (31mm and 1.25" inserts are optional)
- Two Year Warranty Parts and Labor

STT Self-Guiding Filter Wheel

- **FW8G-STT Precise Positioning Filter Wheel with Self-Guiding cover plate**
- Built-in KAI-0340 Guiding CCD with adjustable pick-off mirror and focus
- 8-Position, 36mm carousel (31mm and 1.25" inserts are optional)
- Two Year Warranty Parts and Labor



Optional Accessories for STT-1603ME and STT-3200ME

- STT Remote Guide Head
- AO-8T Adaptive Optics
- LRGB Filters
- Narrowband filters
- Photometric filters
- 31mm and 1.25" filter inserts
- Nikon lens adapter
- Canon EOS lens adapter

© 2015 Diffraction Limited. All rights reserved. The SBIG wordmark and logo are trademarks of Diffraction Limited. All other trademarks, service marks and tradenames appearing in this brochure are the property of their respective owners.

SBIG Astronomical Instruments, A Division of Diffraction Limited. | 59 Grenfell Crescent, Unit B, Ottawa, ON Canada, k2G 0G3
Tel: 613.225.2732 | Fax: 225.225.9688 | E-mail: tpuckett@sbig.com | www.sbig.com

