



TRIOUS PRO-694 BLUE Edition



The new **TRIOUS PRO BLUE Edition** follows on from the incredibly successful TRIUS PRO cameras. It offers the same amazingly quiet drive electronics which gives the lowest read-noise figures and fastest downloads in its class, and now in this new stunning, metallic blue colour.

We have read-noise figures that are better than most CMOS cameras*, along with 16bit data, large full well depths (large dynamic range), and significantly lower dark-noise figure thanks to the impressive compact cooling system; these really are the best deep-sky imaging cameras on the market. With the **TRIOUS PRO BLUE Edition** cameras, dark frames really are a thing of the past, making calibration frames optional rather than compulsory, giving you more time to capture fantastic data that requires less processing.

KEY FEATURES

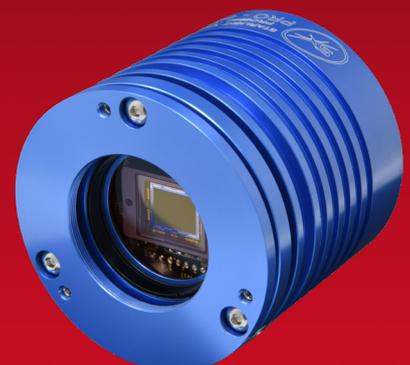
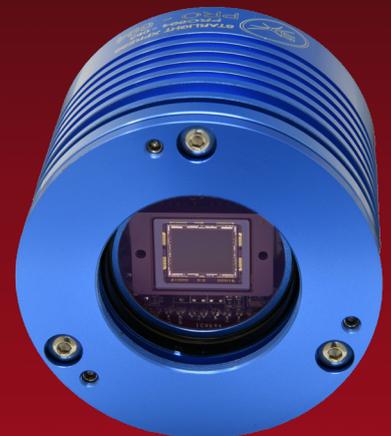
- **Incredibly low read-noise**
- **High QE**
- **Ultra-low dark current**
- **Argon filled CCD chamber**



- **Built-in Powered USB Hub**
- **Collimateable front plate**
- **Faster download speed**
- **Compact and lightweight**

Technical Specification

- CCD type: ICX694AL Exview CCD with ultra low dark current and vertical anti-blooming.
- CCD Full resolution pixel data: Pixel size: 4.54uM x 4.54uM, Image format: 2750 x 2200 pixels
- CCD Image area: 12.49mm (Horizontal) x 9.99mm (Vertical).
- CCD quality: Grade 1 or better - No bad columns, no dead pixels, no more than 50 'hot' pixels (saturated in <10 seconds).
- Spectral Response: QE max at 580nm (~77%), 50% roll-off at 360nm and 770nm.
- Readout Noise: Less than 5 electrons RMS - typically **ONLY 3.5** electrons.
- Full-well capacity: Greater than 17,000 e- (unbinned)
- Anti-blooming: Overload margin greater than 800x.
- Dark current: Less than 0.002 electrons/second @ - 10C CCD temperature.
- Data format: 16 bits.
- System gain: 0.27 electrons per ADU
- Computer Interface: Built-in USB 2.0 compatible interface.
- Image download time: Typically 2.5 seconds at full resolution.
- Power requirements: 115VAC / 240VAC @ 12VA, or 12VDC @ 900mA max.
- Cooling system: Regulated set-point cooling supply with thermoelectric cooler to give a minimum CCD temperature of >-40C below ambient.
- Size: 75 x 70mm black anodised aluminium barrel with 42mm 'T2' thread at the CCD window end & input/output plugs at rear. CCD alignment screws are provided for setting the chip parallel to the focal plane.
- Weight: approx. 450g.





Rear Camera Panel

The TRIUS-PRO Camera provides multiple inputs and outputs. The main control connections to the camera are the USB2.0 socket, that controls the camera from the computer, and the +12v DC jack socket which provides power (approximately 1.5 amps at 12v DC). In addition, there is an RJ11 Guider Port output that is opto-isolated and will drive any standard active-low guider input via the RJ11 ‘telephone’ lead provided. The remaining sockets are three Mini-B 5pin USB2.0 sockets that can be used to control up to three different USB devices, such as a Lodestar Autoguider, an SX USB Filter Wheel and a focuser. Each USB port is capable of providing 5v DC at a maximum of 200mA.



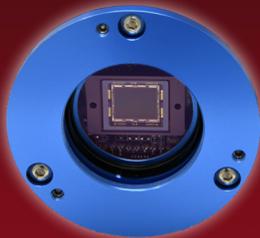
Fused Silica Window

Unlike less expensive cameras, we fit a specially manufactured fused silica window, with a 7 layer anti-reflective coating, to all of our TRIUS-PRO Cameras. This offers exceptional strength and heat transfer characteristics to ensure there is less chance of dewing of the front window during humid weather.



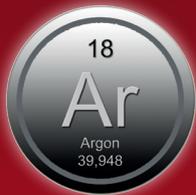
Efficient Cooling System

The cooling system is designed for the most efficient cooling possible in a small compact package. The TRIUS-PRO cameras are fitted with a new peltier cooler configuration to give approximately -45C delta T. A built in fan at the rear of the camera draws air in through small holes in the front of the barrel (which increases the surface area to aid the convection), through the heatsink where all the heat is generated, and expels it out of the rear of the camera. An additional fan is fitted to the side, to help keep the external body at the ambient temperature during warmer weather.



Unique Tilted Camera Front

This unique feature of the design allows the front plate of the camera to be orthogonally aligned to ensure that the CCD and the optics are parallel to each other. This enables the user to adjust for any collimation issues throughout the whole optical train, to ensure pinpoint stars across the entire field.



Argon Filled CCD Chamber

Argon filled CCD chambers are normally only associated with really high-end cameras; the new TRIUS cameras have dry argon injected into the CCD chamber to ensure there is no moisture to condense on the CCD during the cooling process. The low thermal conductivity of argon also helps with the cooling process, allowing a greater delta T to be achieved.

Monochrome TRIUS PRO BLUE Series Camera Specifications

| Product | CCD | Mega Pixels | CCD Size (mm) | No of Pixels/Size | Download Time | Read Noise | Delta Cooling | Size Dia/Length | QE | Weight | Full Well Depth | Data Format |
|---------|--------|-------------|---------------|----------------------------------|---------------|------------|---------------|-----------------|-----|--------|-----------------|-------------|
| PRO-834 | ICX834 | 12M | 12.5 x 10 | 4240 x 2824 (3.1um x 3.1um) | 4.2 secs | <3-e | -45°C | 75 x 70mm | 78% | 0.45Kg | >8K | 16 bit |
| PRO-814 | ICX814 | 9.2M | 12.5 x 10 | 3388 x 2712 (3.69um x 3.69um) | 3.5 secs | 3-e | -45°C | 75 x 70mm | 77% | 0.45Kg | >12K | 16 bit |
| PRO-694 | ICX694 | 6.1M | 12.5 x 10 | 2750 x 2200 (4.54um x 4.54um) | 2.5 secs | 3.5-e | -45°C | 75 x 70mm | 77% | 0.45Kg | >17K | 16 bit |
| PRO-674 | ICX674 | 2.8M | 9 x 6.7 | 1940 x 1460 (4.54um x 4.54um) | 1.2 secs | 3.5-e | -45°C | 75 x 70mm | 77% | 0.45Kg | >17K | 16 bit |
| PRO-825 | ICX825 | 1.45M | 9 x 6.7 | 1392 x 1040 (6.45um x 6.45um) | 0.5 secs | 3.5-e | -50°C | 75 x 70mm | 75% | 0.45Kg | >23K | 16 bit |

*When used at unity gain unity gain