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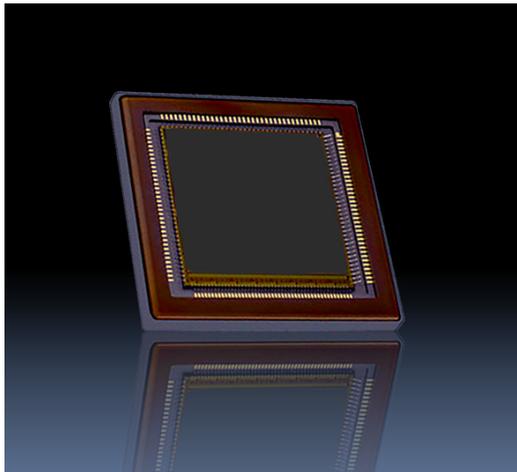
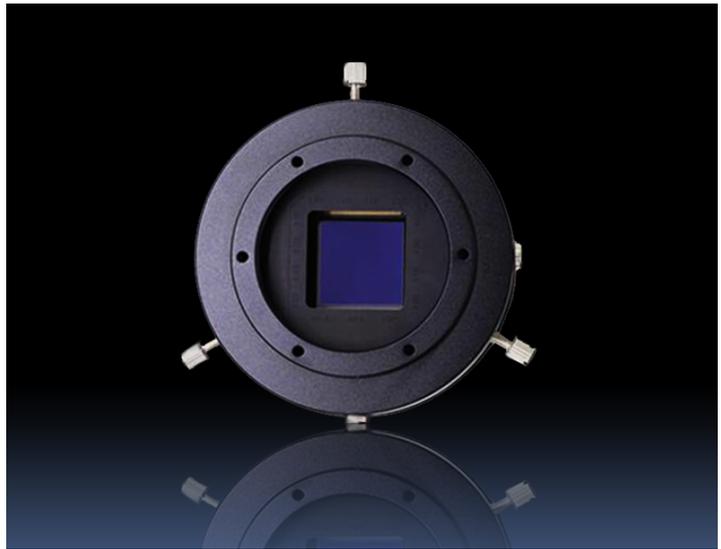
**QHYCCD**



**QHY42PRO**  
**Scientific CMOS**



**QHY42PRO**  
**sCMOS**  
**4.2 Megapixels**  
**Back-Illuminated**  
**1.7e- Read Noise**  
**Monochrome**



**Features:**

- **4.2 Megapixels**
- **Back-Illuminated**
- **95% Peak QE**
- **1.7e- Read Noise**
- **UV Enhanced Version Available**
- **Dual 12-bit A/D**
- **24 FPS at 12 bits, 48FPS at 8 bits**

**Back-Illuminated, 95% QE**

The QHY42PRO uses the GSENE400 BSI Scientific CMOS sensor with extraordinary 95% peak QE, 79% UV QE and very good NIR response, plus extremely low read noise of 1.7e-. This camera is ideal for astronomical and biological science research. The QHY42PRO has relatively large 11um pixels in a 2k x 2k array. The sensor size is 22.5mm x 22.5mm yielding a good field of view even at longer focal lengths.

**Ultra Low Read Noise 1.7e-Photon Counting**

The low read noise and high QE make it possible to achieve high SNR even when imaging dim objects. Only 5 photons produce a SNR>3. Also, there is no microlens array that might influence photometric calibration.

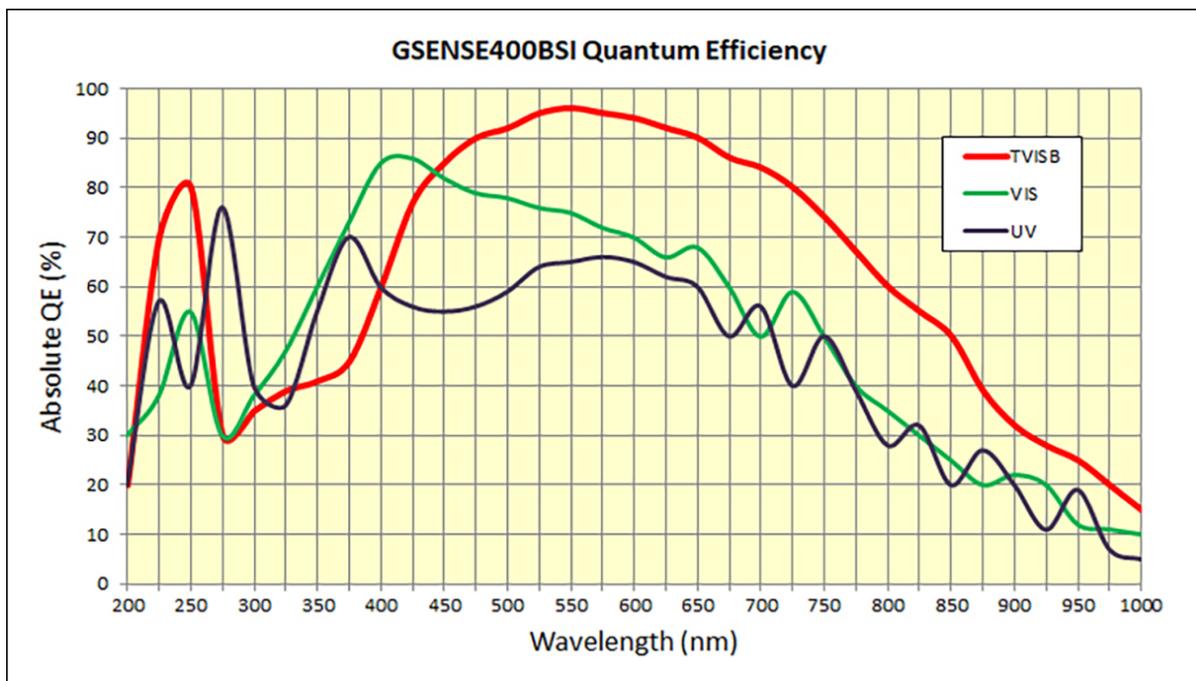
**Multiple Interfaces USB3.0 / 10GigaE Custom Design**

QHYCCD currently produces the standard USB3.0 version QHY42PRO with 24FPS in HDR mode and 48FPS in STD mode. The high speed 10GigaE version is under development and will support 48FPS HDR (2K x 2K x 2 A/D channels with 4096 x 2048 12-bit output).



### Standard Version, 10GigaE Version, Custom Designs

The standard version has 2-stage TE cooling and USB3.0 interface. Single channel output is 24FPS at 12-bits. Dual channel HDR output is 12FPS at 12-bits and 48 FPS at 8-bits in STD mode. Currently under development, the 10GigaE version produces 48FPS with 2 x 12-bit dual channel outputs. (4096 x 2048 RAW HDR output). QHYCCD can supply the QHY42 CMOS sensor board plus the high-performance FPGA based image calculation platform. Five FPGA modes ensures maximum flexibility for the customized project. The original version can be upgraded without cost.



## Preliminary Specifications QHY42/PRO

Sensor	Gpixel GESENSE400 BSI / UV
Pixel Size	11um x 11um
Sensor Surface Glass	Clear Glass / UV enhanced AR coating
Effective Pixel Area	2048 x 2048
Effective Pixels	4 Megapixels
Effective Image Area	22.5mm x 22.5mm
Fullwell	89ke-
A/D	Dual 12-bit A/D (High Gain Channel and Low Gain Channel)
Sensor Size	Typical 2-inch
Full Frame Rate and ROI Frame Rate	24FPS@4096*2048 dual 8bit (HDR mode) 12FPS@4096*2048 dual 12BIT (HDR mode) 48FPS@2048*2048 8bit (STD mode) 24FPS@2048*2048 12BIT (STD mode)
Readout Noise	1.7e-
Dark Current	0.7e-/pixel/sec @ -15C
Exposure Time Range	20us-300sec
Shutter Type	Electric Rolling Shutter
Computer Interface	USB3.0 (QHY42/HDR), 10GigaE Fiber (QHY42/HDR-10G)
Built-in Image Buffer	128MByte (512Mb) DDR2 memory in QHY42/PRO
Non-volatile internal flash memory for image storage	Built-in 100Kbytes user accessible memory for image storage of stellar ROI frames for analysis of exoplanet investigation, occultations, atmospheric seeing measurement, focus, optics analysis etc. Support 100*100 image x 10 frames, 50*50 image x 40 frames, 25*25 image x 60 frames, 10*10 image x 1000 frames.
Cooling System	Dual Stage TEC cooler, -35C below ambient
Anti-Dew Heater	Yes
Telescope Interface	M54/0.75 female thread on the fast installer/center adjust ring
Optic Window Type	AR+AR High Quality Multi-Layer Anti-Reflection Coating
FPGA firmware remote upgrade	Yes, via USB port
Trig Out signal	Optional Support TrigOut hardware signal output

