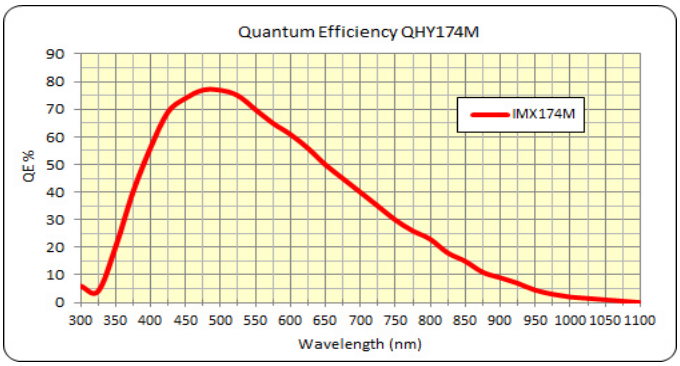
QHYCCD

QHY174-GPS

Time Domain Imager with GPS PPS Synced High Precision Hardware Stamp



The QHY174M-GPS camera is the same as the QHY174M but with the addition of an optional GPS based precision time and location function, useful for imaging occultations, eclipses, meteors, and other scientific imaging requiring a highly precise recording of the time and location of the observation on every frame. The QHY174M-GPS has dual stage TE cooling to -45C below ambient with full anti-moisture control including heated optical window and removable desiccant plug for the sensor chamber. The camera has our 4-pin QHYCFW2 filter wheel control port and a 6-pin autoguider port. The QHY174 also has an anti-amp glow function. It can reduce the IMX174 sensor's amplifier glow significantly in long exposures. The IMX174 sensor has a global shutter and is capable of high frame rates, both ideal features for a time-domain imaging camera. The QHY174M-GPS will record the global shutter exposure starting and ending time with microsecond precision. Two QHY174 cameras, for example, each located anywhere in the world, can have the same time base, accurate to microseconds. In order to guarantee the starting and ending time of the exposure, the QHY174 has a built-in LED pulse calibration circuit precise to 1 microsecond.

LED Cal	AUTO	AUTO
FPS:141		
LAT:400201832		
LON:116197653		
TA:2016/2/11 10:09:23.769486		
TB:2016/2/11 10:09:23.776760		
TN:2016/2/11 10:09:23.776760		
DT:0sec72734us		
NUM:544174		
GPS STATU	3	3

The QHY174 camera is designed to be an excellent planetary, lunar, solar and meteor capture video camera. With a 50mm F1.4 lens it will record mag 8 to mag 9 stars in live video recording at 30FPS (33ms exposure), several magnitudes fainter than can typically be seen with the naked eye. The QHY174's high sensitivity with HD resolution will push video astronomy to new heights.

Master mode: In Master Mode, the camera is free running and the internal 10MHz GPS synced clock will measure and record the shutter's opening and closing time. Slave mode: In Slave Mode you can input a target start time and the interval period for two frames. For example: You want three cameras in different locations (maybe thousands of kilometers apart) to start an exposure at 2016.3.9.UTC 14:00:00.000000 and then to continue with exposures at the interval time of 0.100000 sec. After you input these values, all the three cameras will wait until this time and then simultaneously start video recording. The time stamp and other GPS information is embedded into the image. The software decodes it in real time and displays the information on left. Since the data is embedded, it will never be lost so long as you keep the original image.

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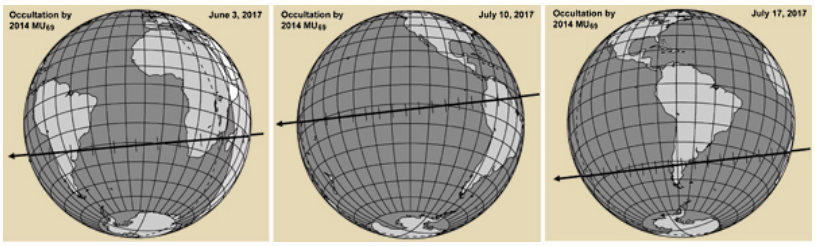
Selected by the NASA New Horizon Team

Now that the New Horizon spacecraft has flown beyond the orbit of Pluto, its next target will be MU69, the most distant object ever imaged remotely by a spacecraft. To make the flyby of MU69 a success, preliminary observations were needed to determine its approximate shape and exact orbit. Such a measurement from Earth required precise timing of exposures taken by multiple observers during an occultation that would last at most 2-3 seconds. The QHY-174M-GPS cameras selected by NASA provided highly accurate timing of multiple exposures per second at 5 different sites, all synchronized to the same time base, enabling an estimate of the unusual shape of the distant object. See: https://www.nasa.gov/feature/nasa-s-new-horizons-team-strikes-gold-in-argentina

"This effort, spanning six months, three spacecraft, 24 portable ground-based telescopes, and NASA's SOFIA airborne observatory was the most challenging stellar occultation in the history of astronomy, but we did it!" said Alan Stern, New Horizons principal investigator from SwRI.



http://www.boulder.swri.edu/MU69_occ/july17.html
https://www.nasa.gov/feature/new-horizons-deploys-global-team-for-rare-look-at-next-flyby-target
https://www.nasa.gov/feature/nasa-s-new-horizons-team-strikes-gold-in-argentina

QHY-174M-GPS			
Sensor	Sony IMX174 Exmor CMOS	**Total Pixels**	2.3 Megapixels
Pixel Size	5.86um	**A/D Resolution**	12-bit
Pixel Array	1920 x 1200	**Read Noise**	3e- to 5e-
Optical Format	1/1.2-inch	**Full Well Capacity**	32ke-
Shutter	Electronic (Global)	**Cooling Delta**	-40C Regulated
Exposure Time	50us - 1800sec	**Computer Interface**	USB 3.0
FPS @ Full Resolution	138FPS	**Weight (Mono/Color)**	450g
FPS @ ROI	490@480x300	**Reference Price (Cooled / Uncooled)**	$1239 / $939

For more information visit http://www.qhyccd.com