- Specifications

Model	QHY600PH (Photographic Version) QHY600PH SBFL (Short Back Focal Length Version) QHY600PH L (Lite Version)
CMOS Sensor	SONY IMX455
Mono/Color	Both Available (while Mono only with QHY600PH-L)
FSI/BSI	BSI
Pixel Size	3.76um x 3.76um
Effective Pixel Area	9576*6388 (9600*6422 with overscan and optically black area)
Effective Pixels	61.17 Megapixels (effective area.
Sensor Size	Full Frame 36mm x 24mm
A/D Sample Depth	16-bit (0-65535 levels) at 1X1 binning 18-bit at 2X2, 19-bit at 3X3, 20-bit at 4X4 software binning *QHY600 uses the software digital binning for 2*2binning. With digital sum, 2*2binning will be four 16-bit summed then it is 18-bit.
Full Well Capacity (1×1, 2×2, 3×3)	Standard Mode ›51ke- / ›204ke- / ›408ke- Super Full Well Mode ›80ke- / ›320ke- / ›720ke-

Full Frame Rate	USB3.0 Port Image Transfer Speed Full Frame Size: 4.0FPS (8-bit output) Full Frame Size: 2.5FPS (16-bit output) 7.2FPS at 9600×3194, 22.5FPS at 9600×1080, 28FPS at 9600×768, 47FPS at 9600×480, 160FPS at 9600×100, Fiber Port Image Transfer Speed (QHY600Pro only) Full Frame Size: 4.0FPS (16-bit output)
Readout Noise	1.0e- to 3.7e-（Standard Mode)
Dark Current	0.0022e-/p/s @ -20C 0.0046e-/p/s @ -10C
Exposure Time Range	40us – 3600sec
Unity Gain*	25 (Extended Full Well Mode) * *With the improvement of the CMOS technology, the 16bit CMOS camera has been released, like QHY600/268 /411/461. For these cameras, even in lowest gain it has beyond the requirement of unit gain (less than 1e/ADU due to sufficient samples) So you can directly set gain 0 as start. Please note QHY600/268C/411/461 has extend full well mode. In this mode you still need to find out the unit gain position.
Amp Control	Zero Amplifer Glow
Firmware/FPGA remote Upgrade	Supported. Via Camera USB Port
Shutter Type	Electric Rolling Shutter
Computer Interface	USB3.0
Built-in Image Buffer	DDR3 memory PH & PH SBFL ver.: 2GBytes（16Gbit） Lite ver. : 1GBytes（8Gbit）
Hardware Frame Sequence Number	Supported

Cooling System	Dual Stage TEC cooler: – Long exposures (> 1 second) typically -35C below ambient – Short exposure (< 1second) high FPS, typically -30C below ambient（Test temperature +20°）
Optic Window Type	AR+AR High Quality Multi-Layer Anti-Reflection Coating
Anti-Dew Heater	Yes
Telescope Interface	M54/0.75
Back Focal Length	QHY600PH&QHYPH-L: 17.5mm+6mm (±0.2) QHY600SBFL: 14.5mm* *The BFL Consumed equals 12.5mm when connecting QHYCFW. About the defination of "BFL Comsumed" and our adapter system please view: https://www.qhyccd.com/adapters/
Weigth	PH Version: 850g Lite Version: 790g
Power	40W/100% 20W/50% 13.8W/0%

Readout Modes and Curves

Multiple Readout Modes is a new function for newer QHY Cameras. Different readout modes have different driver timing, etc., and result in different performance. The QHY600 currently has four readout modes, and more modes will be added in the future. These readout modes are currently supported in the QHY ASCOM Camera Driver, SharpCAP software and the N.I.N.A software.

QHY600 Performance Curves in Readout Mode #0 (Photographic Mode). In this mode there is a drop in the noise between Gain 25 and Gain 26. We recommend setting the Gain to 26 to begin. At this setting the full well is 27ke- and readout noise is 2.7e-. For every long exposures you can lower the gain from this point to increase the full well capacity.

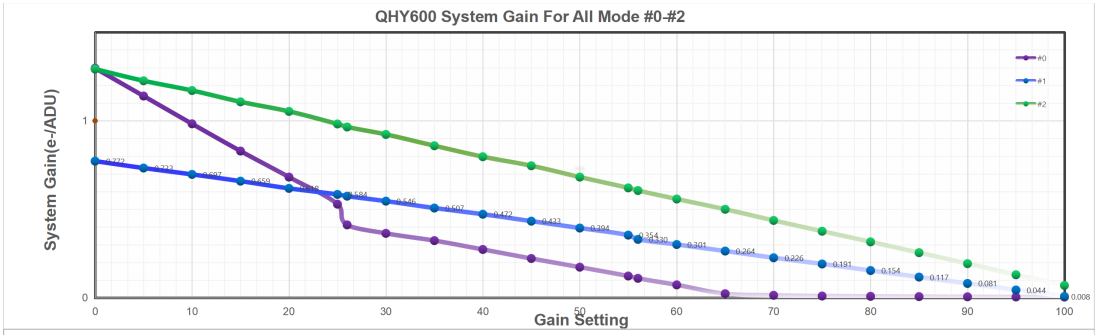
QHY600 Performance Curves in Readout Mode #1 (High Gain Mode). Please note there is a HGC/LGC switch point at gain55 to gain56. Gain0-55 uses LGC and

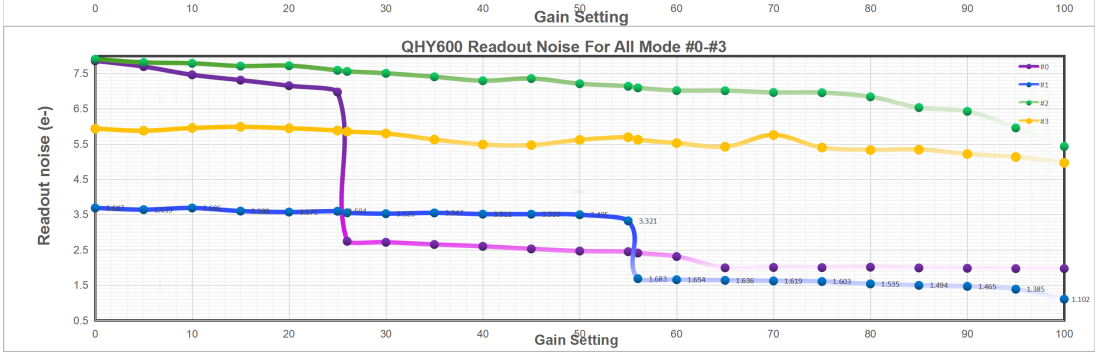
Gain55-100 uses HGC.

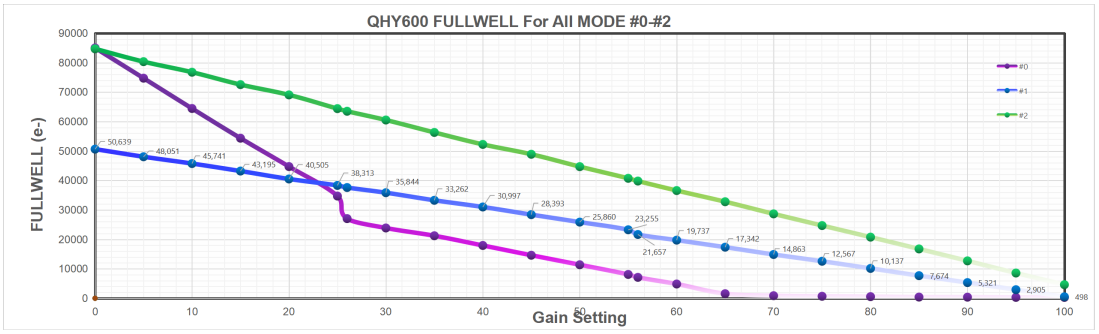
QHY600 Performance Curves in Readout Mode #2 (Super Fullwell Mode).

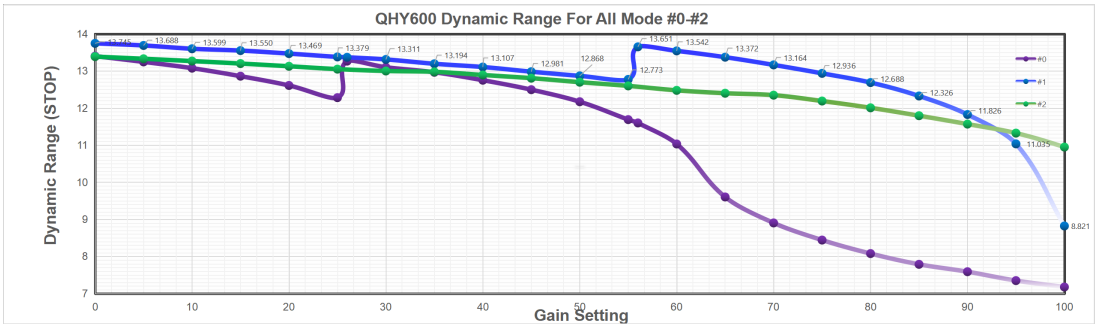
Now QHY600 adds #3 mode Extend Fullwell 2CMSIT (yellow curve). The advantage of this mode is that it has the same full well value and system gain as the #2 mode Extend Fullwell, but the read noise is reduced by about 1.3 times.

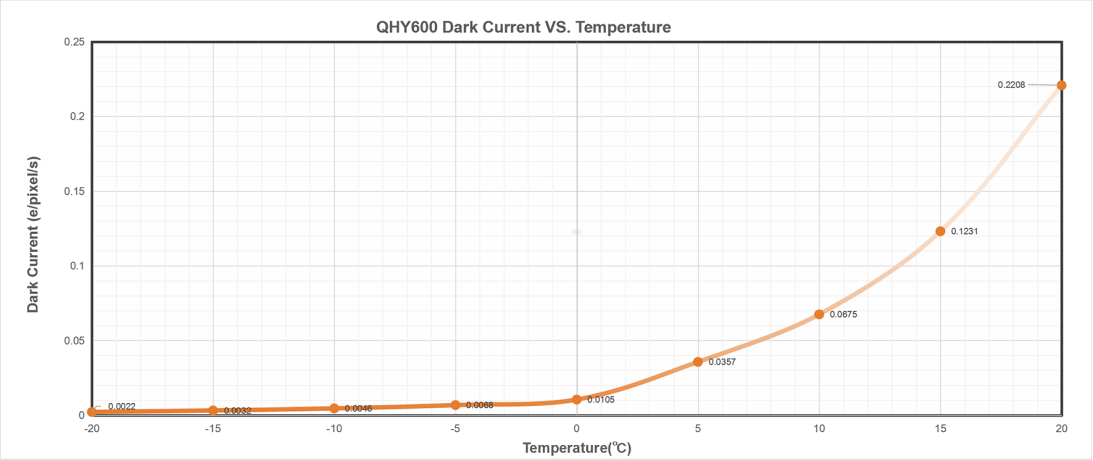
This function needs to be used with 2020.6.26 or newer SDK. If your software cannot display this mode, please download the QHYAllInOne installation package to update the SDK in the software.



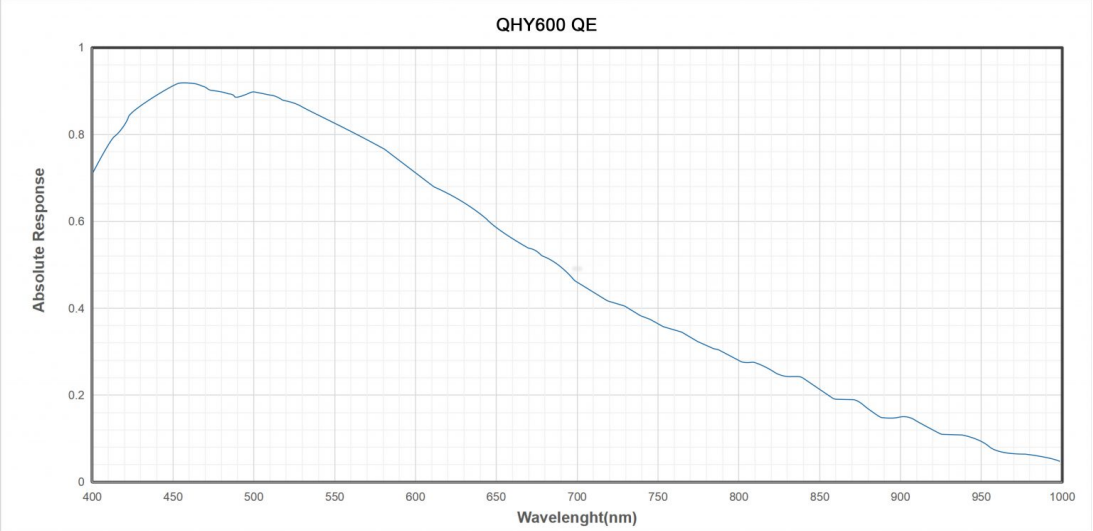








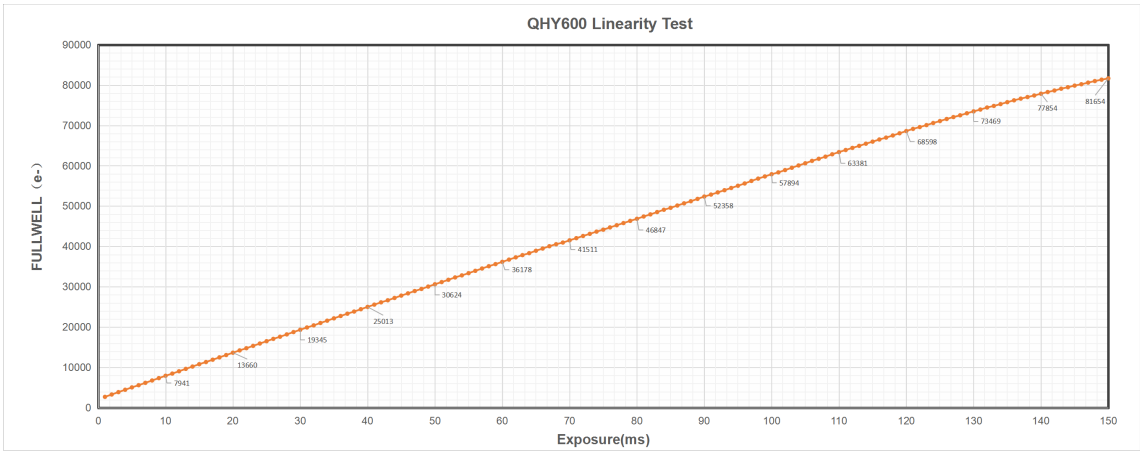
The curve shows absolute QE



(https://www.qhyccd.com/wp-content/uploads/20220119356-scaled.jpg _)

Linearity Test

We did a test for the QHY600 under the ultra high fullwell mode. The results is quite good to show a good linearity response range up to 73ke-. The results can be found here:
https://www.qhyccd.com/qhy600-linearity-test/ (https://www.qhyccd.com/qhy600-linearity-test/)
QHY600 linear test results show good linearity up to 73000e-. This is in readout modes # 0 and # 2. Gain = 0. In the linear fit graph we deleted the data above 73000e- and got R ^ 2 = 0.9998.
At very short exposure times below 20ms the value is quite small and may be flicker induced by the tablet.


QHY600 Linearity Test
FULLWELL（e-）
Exposure(ms)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
7941
13660
19345
25013
30624
36178
41511
46847
52358
57894
63381
68598
73469
77854
81654