

The Phantom 4 Pro Drone Specifications

The Phantom 4 Pro takes the proven P4 and ups the ante in pretty much every single category, including:

- Camera
- Obstacle avoidance
- Safety and redundancy
- Power and flight time
- Video transmission
- Intelligence

In short, this model has so many improvements that many P4 owners (especially those who shoot professionally) may want to upgrade. It's priced at \$1,799 USD.

Since most people use their drones primarily as cameras in the sky, let's look at the camera first. The tried and true Phantom 4 used a 1/2.3" CMOS sensor, with 12.4M effective pixels. It took great photos, shot excellent video, but had a few quirks. Though you could control ISO and shutter speed, it had a fixed F2.8 aperture.

Partly as a result, it wasn't great in bright light – often requiring optional Neutral Density filters to notch things down. Shooting at high noon often brought blown-out or harsh images. It also could get a little noisy in low light. Still, it was (and remains) a great camera at that price point.

[Phantom 4 Pro](#) sports manual aperture control and a whopping *one-inch*, 20-megapixel Sony Exmor R CMOS sensor. That sensor performs on-chip analog-digital signal conversion, and reduces noise in the process. And, apparently, it's very good at what it does.



"I've been wanting to put this sensor in a Phantom since I started working here over three years ago," says Paul Pan, DJI product manager and someone who plays a leading role in product development and design.

Phantom 4 Pro Main Benefits

Are you wondering about Phantom 4 Pro main benefit? We just need to mention the much higher resolution images, better video – and better color intensity. Its video ISO range stretches from 100 – 6400, while in photo mode you can manually push it to 12,800. And while the sensor comes from Sony, DJI is manufacturing the lenses itself. That's correct: It is now making its own glass (possibly a spinoff of its recent minority stake in Hasselblad – though we have not received confirmation on this).



Photography by Chris So

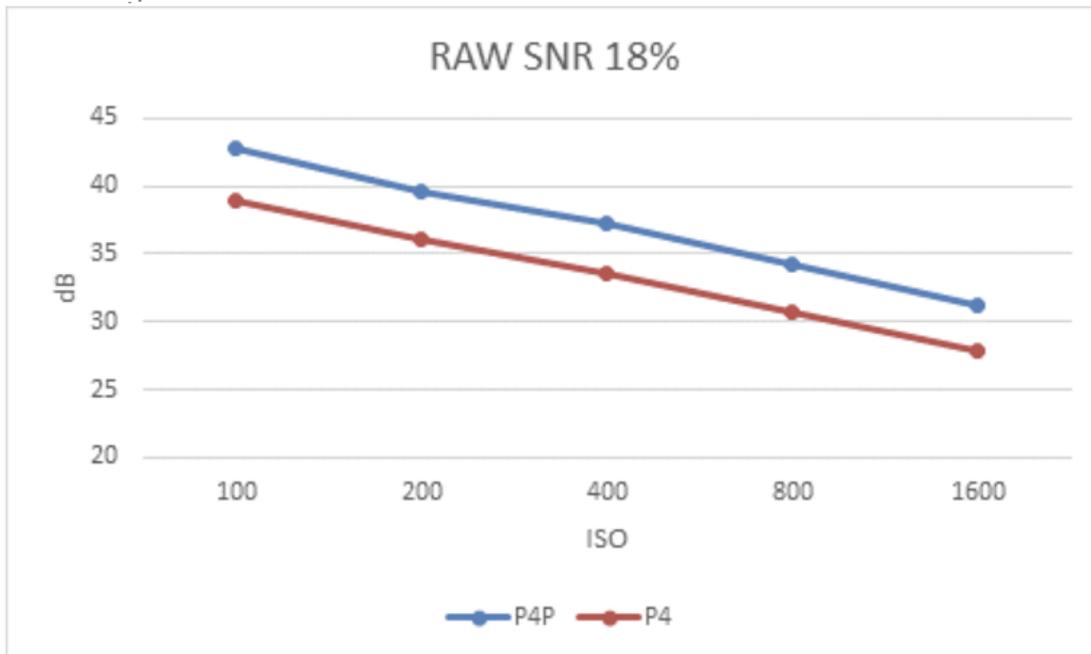
We are having the [P4P](#) camera and glass tested in a lab for a host of parameters. At the moment, results are back for the sensor comparisons. In a nutshell, the data shows improved color sensitivity/depth, signal-to-noise ratio and greater dynamic range. But don't take our word for it – have a look at the lab report:

**Noise
Screen**

	ISO 100	ISO 200	ISO 400	ISO 800	ISO 1600
P4P	38.79	35.61	33.23	30.23	27.18
P4	37.18	34.36	31.85	28.88	26.1

Print (Normalized)

	ISO 100	ISO 200	ISO 400	ISO 800	ISO 1600
P4P	42.76111	39.58111	37.20111	34.20111	31.15111
P4	38.94091	36.12091	33.61091	30.64091	27.86091



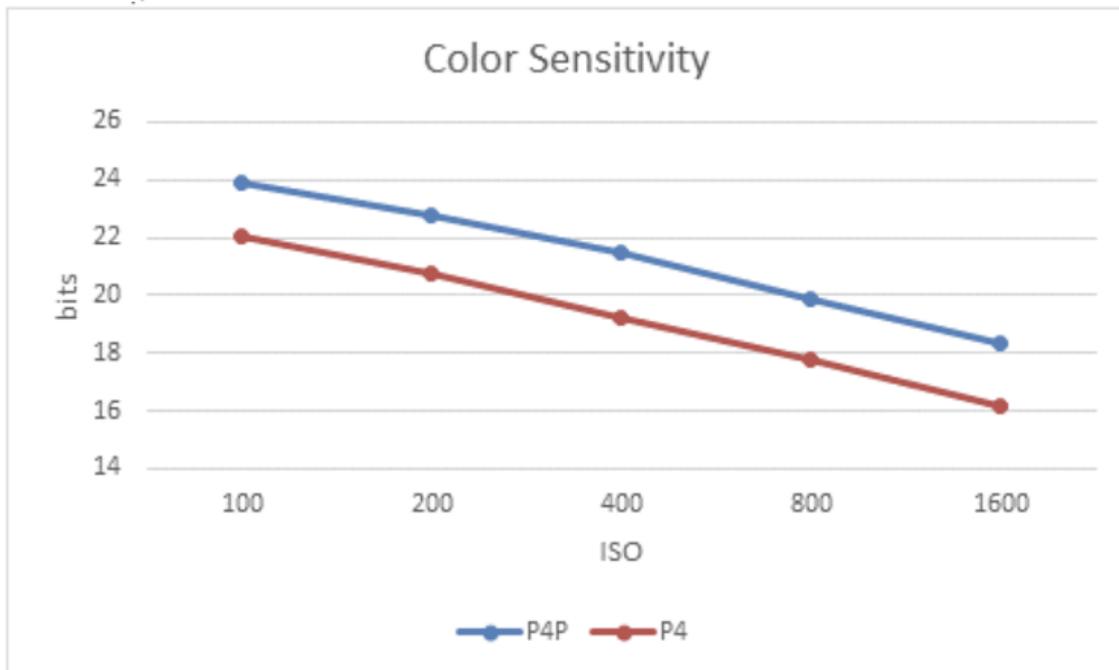
Color Sensitivity

Screen

	<i>ISO 100</i>	<i>ISO 200</i>	<i>ISO 400</i>	<i>ISO 800</i>	<i>ISO 1600</i>
<i>P4P</i>	21.92	20.82	19.47	17.9	16.33
<i>P4</i>	21.13	19.85	18.38	16.89	15.32

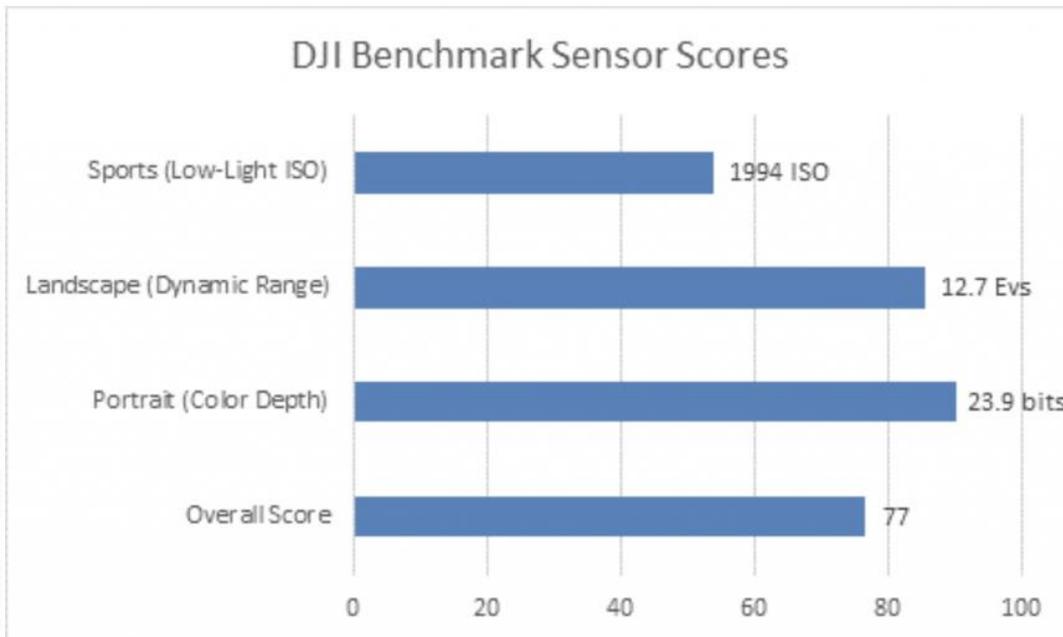
Print (Normalized)

	<i>ISO 100</i>	<i>ISO 200</i>	<i>ISO 400</i>	<i>ISO 800</i>	<i>ISO 1600</i>
<i>P4P</i>	23.89876	22.79876	21.44876	19.87876	18.30876
<i>P4</i>	22.00744	20.72744	19.25744	17.76744	16.19744

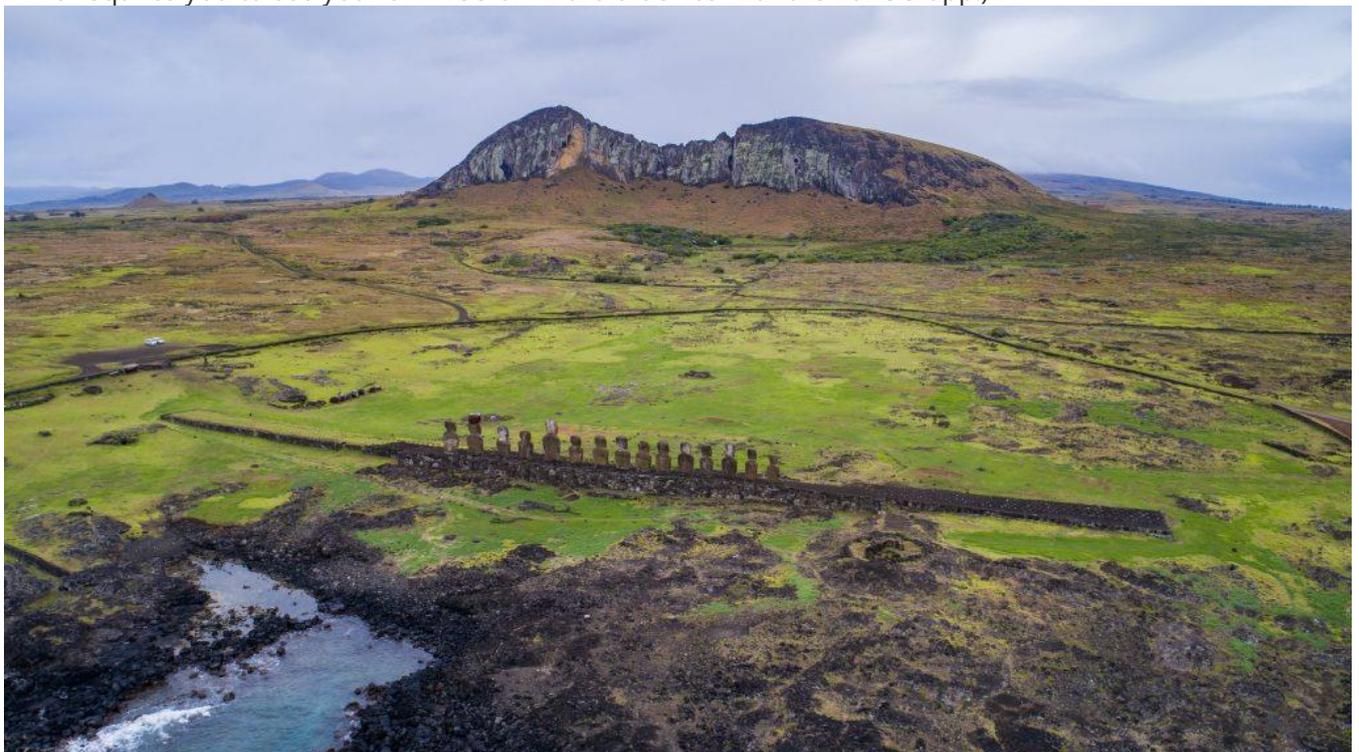


DxO Labs Score

After having the objective results, we looked into DxO database to find camera sensors with a similar performance rating then looked at their overall score. Then finally we rated the P4P sensor's overall score to be 77.



In the meantime, remember that saying: A picture is worth a thousand words? Well, have a look at some of these. They were all taken with either the P4P or the P4P+. (the only difference between the two models is the integrated Android screen on the P4P+ remote. The Phantom 4 Pro requires you to use your own iOS or Android device with the DJI GO app.)





Featuring a manual aperture control from F2.8 – F11, the P4P can shoot 4K video in 60p mode (H.264 codec) @ 100 Mbps. It can also shoot in 24/25/30p with the same data rate. (Those hoping for 120 fps for super slow-motion shots may be slightly disappointed, but the sensor quality will make up for that.)

One of the more important features is that **the Phantom 4 Pro can also shoot with the H.265 codec**. If you haven't heard of that yet, you shouldn't be surprised.

It's a newer **High-Efficiency Video Codec (HEVC)** that offers about twice the data compression ratio. Put another way, it gives you better quality video at the same bit rate. H.265 even supports insanely high resolutions that the Phantom Pro is (thus far) incapable of – meaning up to 8K Ultra High Definition. What's more, this codec is so special you can't play it on most computers yet. But you *can* play it simply by inserting your micro-sd card into the new dedicated slot on your P4P remote. Pop a cable into the HDMI port and you can playback directly to your HD or UHD television. In fact, the HDMI port means you could actually live-stream high-definition video directly to an entire broadcast *network*.

This machine also provides what DJI calls the "PIV" option – meaning Picture-in-Video. If you're shooting video and want to snag a still on the fly, you can do so, with the only caveat that the still photo will be the same resolution as the video format. Field-of-view on the new Phantom Pro is 84° – which translates to the 35mm equivalent of a 24mm lens. Based on supplied photos, it's a really happy medium: Not so wide that distortion becomes a factor, but wide enough to capture amazing landscape photographs. Paul Pan took this shot with the P4P. Click through to see it in higher resolution:



Here at our team, we were also impressed – really impressed – with the dynamic range. And check out the black levels in this image – to say nothing of the lack of apparent noise.



BRAWN

If it came to a race, the [Phantom 4 Pro](#) would end in a dead heat – with both clocking 72 km/hour in Sport Mode (45 mph). However, the obstacle avoidance on the P4P has improved somewhat, meaning you can be flying faster (50 kph or 31 mph) at a brick wall and obstacle

avoidance will still kick in. (we've become so accustomed to the reliability of the P4 and Mavic obstacle avoidance systems that we've occasionally flown the machines directly at our cameras on tripod – and once, (very stupidly), at ourselves – because in our experience the machines always stop. *Please* don't ever do this yourself. Just because we were dumb once doesn't mean you should be – and we accept no responsibility for your actions.)

Wondering about weight? The P4P tips the scales at 1388 grams, including battery and propellers. Factor out the battery, and the body and props weigh a mere 4 grams more than the P4. Yet – as a result of that increased battery efficiency – the P4P can fly for a full 30 minutes (about two more minutes than the "standard" P4 on a good day).



Photography by Chris So

BRAINS

This is one smart machine.

In the relative "old" days, obstacle avoidance cameras were mounted on only the front of the Phantom 4 and Mavic Pro. The new P4P features obstacle avoidance sensors at the front *and* rear, with the ability to sense obstacles from *up to 30 meters away* (which is about twice the Phantom 4 range and explains why the P4P can be flying faster than the P4 and still stop before colliding with an obstacle). So whether you're flying forward or backward – you're still protected. (If you're gunning it in Sport Mode, you're on your own.)



Shot reveals the twin optical and sonar sensors on the bottom of the P4P. *Photography by Chris So*

Ground-facing stereo optical and sonar sensors not only help out in GPS-denied environments (more on that later), but – according to DJI supplied literature, help “avoid landing on an uneven ground and water.” [The Phantom 4 Pro](#) also features “dual GPS, IMU and compass redundancy for enhanced reliability.” In other words, a lot of things would have to go wrong before this machine would fail.

There’s more.

Infrared sensors are built into the sides of the P4P, capable of detecting objects up to 7 meters away. So, providing you’re flying sensibly and not in Sport Mode, you truly have a protective “bubble” surrounding the Phantom 4 Professional.

When we tested the P4P indoors, in a GPS-denied environment, we were in a white, cyclorama-style studio. We wondered whether the P4P would actually be able to detect the walls as obstacles – since everything looked the same. But yes, those cameras and sensors were able to not only detect the three walls of the studio, but also accurately showed their distance on the display. Like the Mavic and the Phantom 4, the obstacle avoidance is accompanied by an audible “beep” that explains why your drone has stopped responding to inputs and is just safely hovering. It’s a feature that will save both novices and experts alike from unwanted collisions. (And face it – who ever really *wants* a collision?)

OTHER BRAINS

The ActiveTrack features we saw in the Phantom 4 and Mavic Pro are here, and then some. There are new modes called Circle, Parallel, and Spotlight modes. Like the Mavic Pro, there is also a Gesture Mode. You can wave to catch the P4P's attention – and be rewarded with a selfie! Those two downward-facing cameras (like in the Mavic Pro) take a burst of photos on takeoff, and then compare those when returning to home. As a result, you can make a precise landing within virtually a centimeter or two of your takeoff point. We tested this in the studio by printing off a target and then taping it securely to the floor so it wouldn't get blown away by prop wash. After takeoff and some minor flying inside the studio, The P4P nestled back into its position within – yeah, about a centimeter or so.

Another useful feature is that the P4P and its remote feature switchable frequencies. You have the choice of transmitting at either 2.4 or 5.8 Ghz, which can be useful in areas where the 2.4 Ghz frequency is more prone to interference. It's as simple as a switch inside the DJI GO app – which we believe is a huge part of the equation in terms of DJI's success. As always, the software is intuitive for beginners who simply want to get in the air but has multiple sub-menus for the more experienced pro who wants to tweak and access every feature available.

Phantom 4 Pro IN THE FIELD

We flew the [Phantom 4 Pro](#) on a very chilly and windy day – which unfortunately was our only option. The temperature (0° Centigrade, or 32°F) reduced our flight time somewhat, but we were still able to test several of the P4P's intelligent tracking features.

In ActiveTrack, we tried out the mode that allows parallel tracking. In this case, our subject (Antonio de la Cruz) walked through a field. As he did so, the P4P flew parallel to his path, adjusting itself when Antonio changed his course. The camera remained locked on Antonio. In TapFly Free – you can simply tap and yaw the P4P in any direction you want.

In a nutshell, we're seeing more and more options where a few taps on the screen can put the drone into modes that capture shots that would normally require very seasoned manual piloting skills.

One that we particularly liked allowed the P4P to orbit Antonio, regardless of whether he was walking or not. A slider on the screen allowed us to determine whether the rotation was clockwise or counter-clockwise, and also the speed of our orbits. Very slick. Like the [Mavic Pro](#), the P4P also will follow a terrain, so if your subject is climbing a hill (or riding a bicycle up an incline), the P4P will track while following the contours of the ground.

Also, because the P4P features obstacle sensing in the rear of the aircraft (via stereo vision sensors that can detect obstacles up to 30 meters away), this innovation allowed for a new intelligent function: TapFly Reverse. In this mode, you can have an automatic sweeping shot with the drone flying in reverse to a predetermined point – with vastly greater confidence that you won't risk a collision. It has great cinematic possibilities, and we look forward to further field tests with this feature.

What we did notice – and this is something we’ve seen with the Mavic and the Phantom 4 as well – is that while the Active Tracking is generally excellent, it’s not perfect. If your subject decides to start moving a little too quickly, or change direction a little too rapidly, the P4P can lose its target lock. The pilot can generally quickly re-tap the screen to re-acquire, but it happened to us a few times during our testing.

In Sport Mode, the Phantom took off like a banshee. DJI claims 45 mph in a straight line in calm conditions – and we don’t doubt it. We had a slight headwind, cold temperatures...and a radar gun. We measured 42 mph (67 km/hr) on more than one run. Plenty fast enough for most people.

We were so busy testing features, we took limited photos with the P4P (and then promptly kicked ourselves once back in the city). However, we did shoot some video while in various tracking modes – which we’ll post separately. We also gave a farmer quite a thrill by letting him take up the P4P on his own after some basic instructions.

One thing we missed trying (there are a *lot* of features to explore) is a new mode called “Draw.” You simply trace your finger along the screen and the P4P will fly that path. This is not way-point flying – think of drawing a figure eight and having it flown in the sky. Lots of options for artistic shooting – and even just beautiful patterns flown in the air.

Overall, this is a first impression review. And our first impressions are very good. We like the camera, the enhanced obstacle avoidance, the new intelligent features, and the increased *oomph* of the battery. We suspect, the more time we have with the camera, the more the advantages of the P4P over its predecessor will become apparent. Having a 1” Sony R CMOS sensor would appear to be a significant step up – and the images we’ve seen so far seem to confirm that.