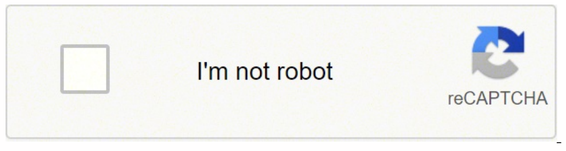


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# Olympus om-d e-m1 mark 2 review

Olympus has played two aces with the E-M1 II. Its 60fps burst mode is a spectacular leap forward in high-speed shooting, and even though you have to step down to 18fps to get focus tracking with moving subjects, that’s still a poke in the eye for heavier, more expensive – and slower – pro SLRs like the Canon EOS-1D X II and the Nikon D5.• Read more: Olympus OM-D E-M10 III vs E-M5 III vs E-M1 IIThis camera’s other party trick is its new all-phase-detection autofocus system – designed to prove that mirrorless cameras can match SLRs for tracking moving subjects. The AF system uses 121 on-sensor phase detection AF points arranged in a rectangular array that covers a much larger area of the frame (80% of the frame width, 75% of the frame height) than regular digital SLR systems.But let’s get back to that continuous shooting capability. The bald fact is the E-M1 II can shoot full-resolution, uncropped 20-megapixel images at 60 frames per second, and it can keep this up for 48 frames (raw or JPEG) – long enough to be much more likely of capturing a key frame than a regular SLR.And if you’re not sure your reactions will be quick enough, there’s a Pro Capture mode that starts buffering frames as soon as you half-press the shutter release so that when you press it the rest of the way, you don’t just capture frames from that point on, but the preceding 14 frames too.All this happens using the OM-D M1 Mark II’s silent shutter mode. It has to lock focus and exposure at the first frame, but it’s designed to be used where the point at which the action will occur can be framed up in advance. The new camera is splash-proof, dust-proof and cold-proof down to 10 degrees Centigrade. It comes with a quoted shutter life of 200,000 shots and an optional new HLD-9 battery grip that doubles the battery life (always a sore point with mirrorless cameras) and has dedicated controls for vertical shooting. Inside the body is a 20.4-megapixel Live MOS sensor measuring 17.3 x 13mm, with an ISO range of ‘Low’ to 25,600. It’s equipped with a newly redesigned five-axis image stabilisation system, which can work in conjunction with a new 12-140m f/4 IS lens, launched at the same time as the camera.The E-M1 II can shoot 4K video in both the C4K (4,096 x 2,160) and 4K/UHD (3,840 x 2,160) formats – and this new lens is designed not only to offer a useful focal range for videographers (24-200mm equivalent) but to offer even better hand-held footage thanks to its own in-built image stabiliser. Olympus is claiming a 6.5-stop shutter speed advantage for this camera and lens, and its video credentials are enough to make it one of the best 4K cameras for filmmaking right now.Build and handlingThe E-M1 Mark II is the largest camera in Olympus’s OM-D range, but it’s positively diminutive next to a pro SLR. The smaller sensor size of the Olympus means it’s at a disadvantage for ultimate image quality, but it brings two big advantages: size and weight.It’s not just about the size of the body, but the lenses too. The 12-40mm f/2.8 Pro lens (24-80mm effective) is half the size and weight of a full-frame equivalent; this goes right across the board, right up to Olympus’s 40-150mm f/2.8 (80-300mm equivalent) and 300mm f/4 super-telephoto (600mm equivalent).Despite the E-M1 II’s relatively small size, Olympus has managed to squeeze on a lot of external controls without making them feel cramped. The key dials are on the right side of the top plate, and consist of a regular mode dial and two unmarked control dials whose function depends on both the mode you’re in and the position of a lever on the back of the camera, just to the right of the viewfinder eyepiece. This effectively doubles up on the control dial functions – as long as you remember to set the lever to the correct position.This is a camera that you can easily get confused with, at least initially. Despite the array of external controls, it also relies heavily on its menu system and an interactive touch-screen control layout, activated by the OK button in the middle of the four-way controller.You don’t have to use the touch system – you can also navigate through the options using the four-way controller buttons and the control dials on the top of the camera.But what about the revolutionary continuous shooting and autofocus modes? These are key features that surely deserved a rethink of the camera’s external layout, with dedicated controls for each. Instead, the E-M1 II follows the same generic exterior layout as its predecessor, giving no real external clue to its enhanced capabilities.The actual shooting experience is hard to fault, though. The electronic viewfinder is crisp and clear with little lag, even in low light, and the shutter action is unusually soft – much softer than its predecessor’s. The feel of the materials and controls is first-rate – this feels such a finely made, high-precision device that you have to remind yourself it’s also been ‘ruggedised’ for outdoor conditions.PerformanceThe OM-D E-M1 II’s sensor is half the size of APS-C and around one-quarter the size of a full-frame SLR sensor, yet you wouldn’t know it from the images it produces. They are extremely sharp; the roll-off in bright highlights is smooth and subtle; and lens aberrations like distortion and fringing are processed out so well that they effectively cease to exist. The OM-D II performs well at higher ISOs too, although larger-sensor rivals pull ahead here.Olympus OM-D E-M1 II sample imagesImage 1 of 5The autofocus response is exceptional: the OM-D E-M1 II’s high-tech phase-detection system focused on this bird of prey in an instant Image 2 of 5With a continuous shooting rate of 60fps, the E-M1 II can reliably capture moments that would require sheer luck with any other camera Image 3 of 5The quality at higher ISOs falls behind APS-C and full-frame cameras – but not by much. The five-axis stabilisation makes this a good low-light camera Image 4 of 5Image 5 of 5The high-tech autofocus system is harder to judge. We got a mixture of duds and successful shots in our early tests. What’s obvious straight away is its static AF speed. It feels at least as fast in single-shot AF mode as any pro SLR. It hunts from time to time in low light, however, or with low-contrast subjects, but the speed at which it can refocus from infinity to a subject close to the camera and back again borders on the uncanny.The E-M1 II is a fraction of the weight and cost of a high-speed pro sports SLR, but it has an autofocus system which narrows or perhaps even eliminates the performance gap between mirrorless and SLR technologies – and can shoot at speeds that no SLR can match. Olympus OM-D E-M1 II specificationsSensor: 20.4MP Micro Four Thirds Live MOS sensor (17.3 x 13mm)Focal length conversion on lens: 2xMemory: 2x SD/SDHC/SDXC (1x UHS-1, 1x UHS-II)Viewfinder: EVF, 2,360k dotsMax video resolution: 4K (4,096 x 2,160)ISO range: ‘Low’-25,600Autofocus: Hybrid phase/contrast detection, 121 points, all cross-typeMax burst rate: 60fps AF locked, 18fps with AFScreen: 3-inch vari-angle, 1,037k dotsShutter speeds: 60-1/8000 sec, BulbWeight: 574g, body only, with battery and memory cardDimensions: 134 x 91 x 69mmPower supply: BLH-1 lithium-Ion battery (supplied), 440 shotsLab testsWe use Imatest and DxO Analyzer hardware and software to test cameras for their colour accuracy (colour error) signal to noise ratio (the amount of noise in the images) and dynamic range (their ability to capture detail in very bright and dark areas). We also pick three rival cameras to test them against. Colour errorScores closer to zero are better It’s not the worst, it’s not the best. The OM-D E-M1 II’s colour rendition is more accurate than the X-T2’s, but the Sony A6300 and Panasonic GH4 are more neutral. Signal to noise ratioDecibels/ISO. Higher scores are better. Raw results use images converted to TIFF The Olympus doesn’t achieve the same performance as the X-T2 or, surprisingly, the rather good GH4. It did better than the Sony A6300 at higher ISOs, though.Dynamic rangeExposure value/ISO. Higher scores are better. Raw results use images converted to TIFF The Panasonic GH4 and Sony A6300 are the winners here, but the Olympus is not so far behind and maintains its dynamic range right through to higher ISO settings. VerdictWe’d want to do more extensive tests before reaching any final decision about the Olympus OM-D E-M1 II’s continuous focus tracking performance, but it’s an extraordinary camera in every other respect. The image quality belies its small sensor, and its static autofocus and burst shooting modes are exceptional.Read moreOlympus OM-D E-M10 III vs E-M5 III vs E-M1 II Best mirrorless cameras Best Olympus cameras The Olympus OM-D E-M1 Mark II ($1,999.99, body only) packs in more technology than any other camera we've reviewed in recent memory. The beefy Micro Four Thirds shooter sports a high-speed 60fps Raw capture mode, a high-resolution multi-exposure capture setting, and an in-body stabilization system that steadies both images and 4K video. It's an excellent camera, especially if you place an emphasis on video capture, but not a perfect one. Its tracking focus struggles at its quickest standard burst rate, and its image sensor lags behind APS-C competitors in resolution and high ISO performance. Our Editors' Choice for high-end mirrorless cameras, the Fujifilm X-T2 ($999.00 at Currys) , doesn't have quite as an impressive spec list, but delivers a more satisfying photographic experience. Design and Controls The E-M1 Mark II ($999.00 at Currys) is styled like a sized-down SLR, complete with an array of dials and switches, and an eye-level electronic viewfinder. It measures 3.6 by 5.3 by 2.7 inches (HWD) and weighs 1.3 pounds without a lens. It's available in black only, and the body is sealed to protect it from dust and moisture. You'll need to pair it with a sealed lens, like the new M.Zuiko ED 25mm f1.2 PRO ($999.00 at Currys) , in order to safely use it in inclement conditions. The E-M1 Mark II has a deeper handgrip than many mirrorless cameras, more in line with the size of a midrange SLR. There's an indentation for your middle finger, which made the E-M1 a very natural fit in my hands. A vertical shooting grip, the HLD-9 Power Batter Grip ($249), is an optional add-on. It houses one additional battery, but doesn't do anything to boost camera performance like the X-T2's add-on grip. Olympus has stuffed a large amount of buttons and dials onto the E-M1's surface. There are two buttons to the right of the lens mount, accessible using your right hand when holding the grip. They are both customizable, with default settings configured to One Touch White Balance and Depth of Field Preview. The only other button on the front is the lens release, located to the left of the mount. The On/Off switch sits on the top plate, to the left of the hot shoe. The body omits a built-in flash, but a small FL-LM3 flash is included in the box, sliding into the hot shoe when needed. It offers modest power (GN 30'), but can cover a 12mm angle (24mm full-frame equivalent) and features 90-degree tilt and 180-degree rotation adjustment. The flash is powered by the camera body. Next to the On/Off toggle, atop a raised circular protrusion, are buttons that control the Drive Mode and autofocus system. The Drive button works with the E-M1's dual control dials (on the right side of the top plate, at the rear and on top of the grip) to adjust in-camera HDR settings and to choose from the numerous continuous and delayed shooting settings that are available. The AF button uses the front dial to adjust scene metering and the rear to change between single, continuous, or manual focus, as well as tracking options and a preset manual focus distance setting. In addition to the standard metering patterns, the E-M1 includes Spot Highlight and Spot Shadow settings. They're useful for tricky scenes, but aren't recommend for general use—it's easy to blow out a scene by metering on the wrong part of an image using Spot Highlight, or to lose detail in the shadows by doing the same in Spot Shadow. The idea is that you'll use Spot Highlight to meter on the brightest part of a scene in order to ensure that highlights aren't clipped, and Spot Shadow to meter on the darkest area to ensure that shadow detail is preserved. You'll either need to center those parts of the frame in your photo, or use the modes in conjunction with the rear AEL/AFL button to lock in exposure. Neither mode is as useful as the Highlight Priority option that Nikon includes in some of its SLRs, including the D810 ($999.00 at Currys) , which analyzes the entire scene and ensures that highlights won't be clipped. The E-M1 uses a Mode dial to set shooting controls, in contrast to the discrete shutter, aperture, and ISO dials used by the Fujifilm X-T2. It sits to the right of the hot shoe and incorporates a locking design. The lock is a toggle that engages or disengages with the click of its center button, so you don't need to hold down a button while turning it. Front and rear control dials rest in the usual places, accessible via your right hand. Fn2, a programmable button that adjusts highlight and shadow curves by default, and the Record button for movies sit in between them. The Fn1 button, which changes the active focus area in conjunction with the front and rear dials, is at an angle at the right rear corner, not quite on the top plate, but not on the rear of the camera either. A toggle button to change between the rear LCD, EVF, or automatically switch using the eye sensor sits to the left of the eyecup, near the top of the rear plate. A small diopter control is nestled into the eyecup itself, on its left side. Rear shooting controls are confined to the right side. There's the 1/2 switch that changes between the primary (aperture, shutter, and EV control, depending on the shooting mode) and secondary (ISO and white balance) functions of the front and rear control dials. At its center is the AEL/AFL button—by default it enables exposure lock only, but you can configure its function. Other rear controls include Info, Menu, Play, and Delete buttons, as well as a four-way control pad with a center OK button. Pressing OK launches an on-screen bank of additional options. These include ISO, white balance, color output, image stabilization, drive, metering, image and video quality, and button remapping. The latter is a big plus, as diving into the E-M1's full, multi-page menu to change button settings is daunting—the camera does so much that it's often difficult to locate a particular setting. The rear LCD is an ample 3 inches in size, with a sharp 1,037k-dot design. It offers excellent brightness and viewing angles, and features a vari-angle design. It swings out from the body, turning to face all the way forward through all the way down, and can fold flat against the rear to protect the screen during transit. Touch functionality is robust. You can tap on an area of the frame to set focus or to focus and fire the shutter. When reviewing images the screen allows you to swipe to navigate through photos and to double tap to zoom in on a shot. Additionally, you can drag your finger across the screen to move the focus point when shooting with the EVF. The EVF is a crisp (2,360k-dot) OLED design. It's a little small for a camera of this class, with a magnification ratio of 0.65x, which is just a little bit larger than the 0.63x optical finder you get with a midrange SLR like the Nikon D7200 ($999.00 at Currys) . The Fujifilm X-T2 sports a 0.77x EVF, which is just a smidgen bigger than the 0.76x OVF used by the top-end Canon EOS-1D X Mark II ($999.00 at Currys) . Despite its small size, the EVF is quite responsive—it refreshes at 120fps, so you can better use it to track action. That's twice as fast as the X-T2 in standard mode, and a bit faster than the 100fps that the X-T2 manages when shooting in Boost mode with its add-on grip. Additional Features, Wi-Fi, and Connections Olympus includes a number of additional shooting modes with the E-M1 that extend its capabilities beyond that of a simple camera. In-camera HDR imaging is included to capture photos that show more detail in the shadows and highlights than most images can manage. There are also Live Bulb and Live Composite modes that show your long exposure changing before your eyes—you can cut off the exposure at any time in either mode. A special high-resolution capture mode utilizes the sensor shift stabilization system to oversample photos, capturing Raw images at 80MP and JPGs at 50MP. The nature of multi-image capture calls for a static subject and a sturdy tripod, but the camera is capable of removing blur that would otherwise be apparent when shooting landscapes with wind-blown grass or flowing water. We looked at the High Res Shot mode in depth when we covered the first camera to support the feature, the E-M5 Mark II ($999.00 at Currys) . The E-M1 Mark II features integrated Wi-Fi, which should come as no surprise—it's a standard feature at this point. Android and iOS users can download the free Olympus Image Share app to copy photos wirelessly, or to use a phone or tablet as a remote control for the E-M1. Full manual exposure control is available, and you can tap on any area of the live feed to set the active focus point. Like most pro-grade cameras, the E-M1 Mark II features dual memory card slots, accessible via a door on the right side. Each slot supports SD, SDHC, and SDXC memory, but only Slot 1 is able to take advantage of the latest high-speed UHS-II memory cards. This is in contrast to the Fujifilm X-T2, which has dual UHS-II slots. If you're shooting at a high burst rate, the camera will take a longer time to write files to Slot 2 than it will Slot 1, even if you use the fastest memory available. The E-M1 has a number of ports, including PC Sync to connect a studio flash system, a 2.5mm jack for a wired remote control, two 3.5mm jacks for headphone and microphone, micro HDMI, and USB-C 3.0. In-camera charging isn't supported; a dedicated battery charger, with a detachable plug, is included. The charger has the brightest green charging indicator I've ever seen. It lit up the living room of my apartment like a nightlight, and when I was traveling with the E-M1 I had to use an outlet in the hotel bathroom in order to stop it from brightening the room to the point where my sleep would be disturbed. If it bothers you, invest in some gaffer tape to cover the light. CIPA rates the battery for 440 shots per charge. Performance and Autofocus The E-M1 Mark II is powered by a quad-core processor, and it certainly shows it. It starts, focuses, and fires in 0.7-second, a good mark for any mirrorless camera. Focus speed is lighting fast, about 0.05-second in bright light and 0.1-second in very dim light. The autofocus system is matched with an incredible burst rate. The E-M1 shoots at 15.4fps using its mechanical shutter. It keeps that rate up to 54 Raw+JPG, 73 Raw, or 108 JPG shots before pausing. I tested with a SanDisk 280MBps memory card in the UHS-II slot and had to wait 22.8 seconds, 9.5 seconds, and 6.4 seconds, respectively, for all files to be committed to the card. See How We Test Digital Cameras There's also a fully electronic shutter option. Using the e-shutter boosts the AF-C speed to 18fps at maximum and the AF-S speed to a blistering 60fps. It can only keep the 60fps rate up for a short duration—roughly 45 shots, regardless of file format—and requires similar time to clear the buffer to card as with 15fps capture. There's an additional 60fps capture mode, dubbed Pro Capture, that starts to buffer shots when you press the shutter release halfway down to engage autofocus. It has a configurable frame rate—15, 20, 30, or 60fps—and can buffer up to 14 shots. It's a good tool for capturing the perfect moment of action, but because it fires so quickly and utilizes the electronic shutter, you can't utilize a flash. It's best used for brightly lit outdoor scenes in order to get a crisp shot that freezes fast motion. The E-M1 is supposed to be able to track subjects and keep them in focus at 18fps. And, depending on what you're shooting, you may be happy with the results at that speed. If your subject is moving left to right, without a lot of motion toward the front of the camera, it does so with great confidence and a solid hit rate. But the camera struggled in our back-and-forth continuous autofocus test, netting out-of-focus results as our test target moved toward and away from the lens, even after setting the focus system to prioritize . Dropping the burst rate to the the low setting—still a blistering 10fps—netted crisply focused shots. Tracking at 10fps is no small feat. It's slightly quicker than what the Fuji X-T2 can manage with its Booster Grip (9.6fps), and is in line with top-end APS-C SLRs like the Nikon D500 ($999.00 at Currys) and Canon EOS 7D Mark II ($999.00 at Currys) . But both the X-T2 and D500 have focus systems that offer a bit more coverage at the edges of the frame—the E-M1's focus area is surrounded by a border on all sides that lacks focus capability. I would prefer if the camera limited its speed to a rate that could net consistently focused images when set to C-AF or C-AF with Tracking. Image and Video Quality The E-M1 uses a 20MP Micro Four Thirds image sensor, physically smaller than the APS-C sensors used by competing models like the Sony Alpha 6500 and Fujifilm X-T2, with a 4:3 native aspect ratio rather than the more common 3:2. Like the Alpha 6500, the E-M1's sensor is stabilized using a five-axis in-body system, a feature that the Fujifilm X-T2 doesn't offer. It ensures that any lens you attach benefits from stabilization, and works in conjunction with lenses with their own stabilization system, including the Olympus M.Zuiko ED 300mm f4.0 IS PRO ($999.00 at Currys) , to provide more steadying than either lens or camera could provide on its own. I used Imatest to check image noise at each full-stop ISO setting. When shooting JPGs at default settings, the E-M1 keeps noise under 1.5 percent from its base ISO 200 sensitivity through ISO 6400. Image quality isn't perfect when pushing the camera that far. It does a fine job capturing minute details in our test image through ISO 800, and shows very slight blur at ISO 1600. The blur is slightly more noticeable at ISO 3200, and details smudge together at ISO 6400. JPG images start to show significant blur at ISO 12800, and you should avoid shooting JPGs at ISO 25600. This is where the X-T2's larger, 24MP image sensor has an advantage—it delivers noticeably crisper results at ISO 12800 and 25600. You can opt to shoot in Raw format to eke more detail out of the sensor. In-camera noise reduction isn't applied to Raw images—our standard Raw converter, Lightroom CC ($999.00 at Currys) , does apply some color noise reduction, but we use standard settings for every tested camera to put them on equal footing. The E-M1 Mark II does a fine job with image detail through ISO 3200, but it does show more grainy noise at that sensitivity than the X-T2. Noise becomes more of an issue at ISO 6400, where it detracts from fine detail, while the X-T2 again wins out. At ISO 12800 images are very grainy, but detail remains strong, while the amount of noise at ISO 25600 really detracts from an image. Again the X-T2 betters the E-M1 Mark II at these extreme ISO settings. Where the E-M1 Mark II outperforms the X-T2 is in video. Both shoot in 4K, but the Olympus doesn't show any sort of rolling shutter effect when panning, and its in-body stabilization is a big plus for handheld capture. It can shoot at 24, 25, or 30fps in 4K UHD with a 102Mbps compression rate, and supports 1080p capture with a stunning 202Mbps All-Intra compression scheme at the same frame rates. To add 50 or 60fps options you need to drop the 1080p capture rate to a more pedestrian 52Mbps bit rate. The highest bit rate video is the Cinema 4K setting, which shoots in DCI resolution at 24fps with a 236Mbps bit rate. It's not as robust a video toolkit as Panasonic's competing Micro Four Thirds model, the GH5, but it's a solid option for any enthusiast and certain types of professional use. The internal mic is just like any other—it picks up the sound of my voice, albeit with a hollow sound and loads of background noise. For serious work, connect an external microphone, and utilize the headphone jack for monitoring levels. The autofocus system in video delivers smooth, slow racks, without any hunting back and forth, allowing you to concentrate on getting the shot rather than manually pulling focus. Conclusions The Olympus OM-D E-M1 Mark II packs more technical bells and whistles into its small frame than any other mirrorless camera we've seen. It has a blisteringly fast maximum Raw capture rate, even though it's very limited in duration, and a solid buffer for shooting at a more reasonable 15fps when utilizing the mechanical shutter. Subject tracking doesn't work well when shooting at the fastest speeds, but it does a solid job keeping track of moving targets at 10fps—better than most cameras out there. Add 4K video in both UHD and DCI formats, in-body stabilization, an all-weather build, and access to the expansive Micro Four Thirds lens system, and you've got a powerhouse. But at $2,000, it's one of the priciest cameras out there, not counting those with larger full-frame image sensors, and it's sadly the Micro Four Thirds sensor that holds it back in terms of image quality. The E-M1 Mark II falls short of the clarity and high ISO performance delivered by competing 24MP APS-C models, including our Editors' Choice Fujifilm X-T2, which also has an advantage in price, selling for $400 less. If you're looking for a serious mirrorless camera for shooting fast-moving action, it's our top pick. But if you're already invested in Micro Four Thirds, rest assured that the E-M1 Mark II is best, most capable, member of the system we've tested to date. It simply faces some very stiff competition at the top end of the market. See It $1,399.00 at Amazon MSRP $1,999.99 Pros Vari-angle touch-screen display. High-resolution capture mode. Optional vertical battery grip. View More Cons Only one SD slot supports UHS-II. Tracking focus ineffective at top speeds. 60fps shooting is limited in duration. Very bright charging LED. View More The Olympus OM-D E-M1 Mark II shoots faster and does more than other high-end mirrorless cameras, but it's also more expensive. Sign up for Lab Report to get the latest reviews and top product advice delivered right to your inbox. This newsletter may contain advertising, deals, or affiliate links. 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