Pico 4 Enterprise Adds Eye & Face-tracking for Business While Drastically Undercutting the Competition

By **Ben Lang** - Oct 20, 2022

In addition to the consumer-focused Pico 4 headset launched this week, the company is also getting ready to release a business-focused variant called Pico 4 Enterprise, which brings to the platform eye and face-tracking for a price that aims to compete.

> ***Update (October 20th, 2022)**: It was previously reported that the Pico 4 Pro would be the naming scheme for the company's business variant, which includes face and eye-tracking, however the company now says it will be marketing the headset as 'Pico 4 Enterprise' in the following regions: EMEA, India, Australia and New Zealand. Confusingly, Pico 4 Pro is the naming scheme used in China, where it will be marketed as a consumer-focused device, and offered with 512GB storage. Both Pico 4 and Pico 4 Enterprise feature 256GB.*
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> *In addition to Pico 4 Enterprise December release date, the company revealed the standalone headset will be priced at €900 or the equivalent in those regions mentioned above, and will include enterprise software management tools. Pico says it's making it available to registered businesses, and not consumers.*
>
> *That puts Pico 4 Enterprise at €500 less than its leading competitor, HTC Vive Focus 3, and that's even before adding officially supported aftermarket face and eye-tracking modules to Vive Focus 3, which would bring Vive Focus 3 to €1,760 in order to match Pico 4 Enterprise's €900 price tag; that's around the same as Meta's Quest Pro mixed reality headset.*
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> *To avoid confusion, we've updated the piece below to reflect the Enterprise naming scheme.*

***Original Article (September 23rd, 2022)**: With the announcement of Pico 4 this week, Pico is squaring up to compete with Meta's Quest 2. But the company is seemingly also trying to ready itself against Meta's upcoming Project Cambria, a high-end enterprise-focused standalone headset (which is rumored to be called the Quest Pro).*

Alongside the announcement of Pico 4, the company announced Pico 4 Enterprise. Apparently due out later this year, the headset appears to be largely the same from a hardware perspective but with the addition of three internal cameras for eye and face-tracking.

With eye-tracking, Pico says the Pico 4 Enterprise will support automatic IPD adjustment by measuring the user's IPD each time the headset is put on and then adjusting the IPD distance with a motorized drive. While the Pico 4 also includes a motorized drive, it lacks eye-tracking so the IPD value must be set manually.

SEE ALSO
Meta Releases 'Citadel' Co-op VR Adventure, Its Second Marquee Title in 'Horizon Worlds'

Pico also claims the internal cameras can be used for "52 points" of face-tracking, though it isn't clear if most of those are directly sampled or inferred from a model. Face-tracking is difficult to get right (because the results are highly subject to the uncanney valley and getting a clear view of the face is difficult); the only commercial headsets that have attempted face-tracking have had to employ bulky under-slung cameras. It will be interested to see what Pico can achieve from a largely hidden camera (which is presumably aimed down toward the user's mouth).

Aside from eye and face-tracking, it appears the Pico 4 Enterprise will be essentially the same hardware otherwise, including a Snapdragon XR2 processor, 2,160 × 2,160 (4.7MP) per-eye resolution, and pancake lenses with a claimed 105° field-of-view. You can see a detailed list of specs for the headsets here.

> ***Note**: It was revealed that Pico 4 Enterprise also includes 8GB of LPDDR5 RAM, an upgrade over Pico 4's 8 GB LPDDR4 RAM.*

On the software side, however, Pico 4 Pro will be substantially different. The company says the headset will include an enterprise focused variant of its operating system and won't require any kind of "personal identification" to operate, which hopefully means no logins.

Pico has yet to announce a specific release date for the Pico 4 Pro, nor a price, though it says the headset will come later this year and will become available in the US at some point.

Additional reporting by Scott Hayden.

- *TonyVT SkarredGhost*
  We'll have updates about it at AWE EU in Lisbon

  - *ViRGiN*
    yeah we did, absolutetly nothing interesting.

- *MeowMix*
  One thing worth pointing out is all the non-Meta headsets that feature eye/face tracking are leveraging tech from Tobii as their tracking solution. I wonder how much of a licensing fee this adds to the device ? Those can be potential savings for the Quest3 (if it features eye/face tracking), since Meta is using an inhouse tracking solution. It also brings up the question will there be a noticeable difference in quality between Tobii and Meta's eye/face tracking.

  - *Christian Schildwaechter*
    I did some back-of-the-envelope calculations when news came out that Sony was partnering with Tobii for eye tracking to guestimate how much of the PSVR 2 price could be licensing fees, mostly by looking for the price at which it would become cheaper for Sony to simply buy Tobii.

    I still assume that Sony will try to sell a lot more PSVR 2 than PSVR 1 by making it very cheap, so my base number was 20mn PSVR 2, which would have put the upper limit to USD 18 of license fees to Tobii per PSVR 2. Given that Tobii is still independent, the actual fee per unit should be significantly below that, in the single digits. Other companies wouldn't get as favorable conditions, as they would depend on guaranteeing millions of sold devices. Tobii might also demand more for devices that are intended/allowed for commercial use, and take extra fees if more of their own IP was used during development.

    But the price should be nowhere near the USD 250 that a completely assembled Tobii eye tracking module for the Focus 3 would costs, the calculation of which is based on it being a niche product within the VR niche selling at very low numbers and having to recoup development costs with these. 10%-20% of that just for the license of software and patents seems more likely.

    - *silvaring*
      Christian I appreciate your comments here and your insights, but please lets not equate the value of eye tracking to a simple dollar figure based on what the B2B companies have agreed on, you know as well as I do that any R&D that Tobii have done on eye tracking is irrelevant compared to what the value is that advertisers or propaganda pushers see in the technology and are willing to spend after the PSVR2 and future headsets begin to come out. For all we know Sony could have a licensing agreement that enables them to get telemetry on ALL future headsets using Tobii technology, and we probably will not know for a number of years if any such agreement is even made. The sheer value of eye tracking data (compared to just head and controller tracking data) though should make us all very concerned as to who is involved and where that data is going.

      - *ViRGiN*
        christian is completly out of touch with reality.
        too much time spent on steam.

Christian Schildwaechter

My main wish is that the “enterprise focused variant of its operating system” allows access to the passthrough camera feed, like the older Pico SDK did. Pretty much every other HMD vendor has blocked this for (valid) data privacy reasons, even HTC, who initially allowed it, but then removed the function. It’s probably accessible on the Varjo XR-3, but USD 11.000 is quite out of my league.

AFAIK the (legacy) Pico SDK requires the user to authorize access to the feed for every single use, and I’m not even sure if developers get access to the feed itself or only snapshots. But being able to do image processing on the environment is essential to start developing true AR applications that can recognize and then actually augment objects, while so far all the passthrough can only be used as a non-interactable background image. So at least a cumbersome loophole to the “no camera access” is needed, be it with lots of required user approval or limiting it to development builds.

Steve R

Do phone-based SDKs give direct access to the passthrough camera feed? It would seem like the privacy issues would be the exact same, so I would expect XR SDKs will follow what is done with phones.

Christian Schildwaechter

On a phone developers get access to the cameras (if the users grant it), because recording images is the primary purpose of putting cameras onto phones and people intentionally record and want to be able to manipulate the images or movies with apps. Users also have full control what and where they are filming.

On headsets the filming of the environment is a side effect of tracking, and usually happens at home, so the users cannot turn off lots of their private items and other people getting recorded in the process. The passthrough image so far was also so grainy that there was no interest in using the cameras for recording like on a phone. So it makes quite a lot of sense that apps don’t get access to the camera feed on HMDs, as there is no way for users to control the images.

This will become a big problem once we have AR glasses, because the users all of a sudden have an interest that apps can see their environment, but currently there are no ways to stop apps from also uploading lots of private images to remote servers unbeknownst to the users. Closing it down will not work, and the current practice of phone apps asking for permission to access camera or microphone is most likely insufficient. But we have to start somewhere, which is why I’m hoping for at least a tiny loophole for developers to start trying different things.

Steve R

I was meaning AR SDKs and use cases for the phone (Arkit, etc.). If an iPhone AR app has direct camera access, I don’t see why headset/glasses AR apps would be any different (both would have the same uploading problem you described). So I was wondering what access the phone-based AR SDKs have.

Christian Schildwaechter

Currently the same: as the user decides when s/he uses AR, it is fully user controlled and easy to avoid recording private items, access on phones is granted the same way as for taking photos. AR apps are currently just a occasional, minor use case for phones, so while the on-demand activation combined with the user actively having to aim the camera doesn’t really solve the problem of unauthorized uploads, it makes it easy to limit potential damage.

In theory one could create AR HMDs that only activate when pressing a button, but the more likely use will be always-on usage like with Siri or Alexa. Those require an activation word that is processed only locally, and only after this trigger recordings are send to a remote server for analysis. Which works because it is never clear if what was said was even directed at the device, while a head set will always be pointed at what the users is currently interested in, making a separate activation unnecessarily cumbersome.

The closest to the permanent camera access problem in XR HMDs is the location tracking phone apps do in the background, where users often aren’t aware that this is used to build movement profiles. And that is much less invasive than broadcasting pictures of one’s home. Technically phone AR and AR glasses are very similar, but the different mode of activation and typical usage environment is what makes it necessary to treat them very differently.

ViRGiN

Too long

ViRGiN

get a life dikhead

Karsus

Yes. Imagine theming your environment using AI, so that your room looks like a jungle, or a spaceship… Or whatever speaks to your aesthetic sense.

iNCEPTIONAL
No personal ID and stuff like that–THAT is what I want from a f'n VR headset!

I'm sick and tired of all the crap I have to put up with just to play my f'n Quest 2.

Here's what I want to be my headset out the box: The headset and controllers, a menu that has a couple of essential apps (and I mean damn essential), and the store to allow me to buy more apps WHEN AND IF I CHOOSE TO DO SO, and nothing else. No user accounts out the box, no avatars, no linking to Meta/Facebook/Oculus, no adding credit card details, no forced training videos–nothing else.

Tommy
How would you purchase your games and how would the platform know which games you own but don't have downloaded without some sort of account?
Sounds like VR utopia though :)

iNCEPTIONAL
You would set that up later as and when you choose to do so. All that needs to be there out the gate is the store app, ready for you when you want to buy new games and apps. But, until then, the headset would come with and only require the bare minimum stuff pre-installed and with no requirements to set up any online store accounts or avatars or link with any social media or anything like that, so people can actually get into it and use it with zero friction.

Anonymous
Wait until you cry the day you realize how much information the CCP steals from you in the most ingenious ways ;)

Chinese hardware are a global security threat and should be banned. Period.

Karsus
Pretty much all modern tech is looked at by hackers and activists. The chances that this headset would get away with sending unusual data without people knowing about it are slim.

ViRGiN
oh yeah, just like every device is hackable, yet nobody in the world ever hacked any quest.

Karsus
Not every device is hackable. In order to hack a device, you need a flaw that the developers didn't catch, that can be exploited.

In recent years, security has advanced a lot. And if you take security very seriously (like banks do), then hacking it isn't that easy.

Of course, if you have a device in your hands, you can do a lot with it. Or if you can get the login rights of someone who has a lot of power in the system… But people increasingly try to limit how much power anyone gets to have… That way, it's harder for someone's mistake to lead to significant problems.

johann jensson
Steam?

johann jensson
Fully agree. A VR headset is just a peripheral for me, to be able to step into stereo3D/VR. A peripheral with the function of a monitor and the complex (and hidden) interface of a hard disk. All the friction bullcrap of the Quest 2 is what made me lose interest in VR, besides lack of proper games or at least game ports of proper games (AAA).

Dave
You're living in a dreamworld Neo. Every access to every online system today has an identity so actions online are made accountable to the user. Creating an environment where that is optional effectively means you can't get online and therefore makes any headset practically useless. What did you think you could buy a headset and just download free standalone games? Companies are going to make a fortune of that arn't they, that makes there 3 billion investment worth while, congratulation you've just killed VR.

Sky Castle

Unlike consoles it seems like there are more vr headset hardware releases than games. I've gone through 5 major vr headsets now and only 1 true AAA (HL Alyx) game and dozen indies, short experiences since the Rift 1. Not counting AAA remakes.

Jistuce

There isn't really a large enough VR audience right now to support a AAA game with it's utterly ruinous development budget. We're in the experimental "what even works well with this interface" phase of the market.
(Which is part of what makes VR exciting to me. I find AAA games to all be rather same-y, as the rising costs of making video games led directly to a more risk-averse market that doesn't experiment.)

Gorgon Freemen

Quest 2 sold as much units than the consoles of each, if not more than some and yet consoles has many AAA games and also AAA exclusives and then if you count every other HMD, yeah i think VR wins…..

ViRGiN

fun fact. alyx wasn't an AAA game at all, it just carried an AAA name. if it was called Adventures in Abandoned City, the game would flop hard, like everything does on PCVR that isn't beat saber.

Andrew Jakobs

I do hope they would also release the Pro with a black faceplate, as that golden one on the image is fugly as hell, like staring at a butthole..

Christian Schildwaechter

You could just add a pair of large googly eyes to make it look less obscene and more professional.

Gorgon Freemen

Buttholes look gold to you? You must value buttholes a lot.

ViRGiN

Yeah, looks like Steam.

ViRGiN

what a no-life, gabe foot worshipper.

DirkW

For me, the biggest thing with eye tracking, is foveated rendering. This can be a game changer in all kinds of VR games and applications.

Shuozhe Nan

Yesterday in the release stream for neo 4 they also announced the pro game/play edition for December for 3799/3999 (preorder price i guess ~550/580€). Images are in a r/virtualreality from a burried post from yesterday.

DownloadVR podcast also mentioned 4 pro will only exist as 4 enterprise in western market :

Andrew Jakobs

You mean the Pro will be about 580 euro's? As an enterprise version it sadly will be much more expensive.

Shuozhe Nan

Game edition of 4 pro was announced yesterday for December in China.. expect enterprise to be +50-100%^^

Andrew Jakobs

Oh, that's great for china, sad for us, as 580 euro's would be a great price for the Pro. The enterprise edition of the Pico 3 Pro was about 350 euro's more than the consumer Pico 3 Pro Link edition. As far as I know, hardwarewise the only difference between the Pico 4 and the Pico 4 Pro is the addition of eye/facetracking and the ugly golden faceplate. So I do believe a 'gamers edition' would be around 150-200 euro's more due to the eye/facetracking, when I look back at the differences between previous headsets with and without eyetracking.

Max-Dmg

Does this require a VR headset?

- *Butterbean*
  No mention of AR, which is the main focus of the Quest Pro. It looks like they're still using a single lens for passthrough so it won't be stereoscopic.

  - *Andrew Jakobs*
    Who knows, maybe they'll do a same trick like the Quest Pro of using the other camera's for the stereo vision and the color camera for the color layout. The Pro also doesn't have dual color camera's.

  - *Christian Schildwaechter*
    Is AR even possible on the Quest Pro? What is now called Mixed Reality is not really AR, it is overlaying a mostly static model of the environment, either generated manually or from/with the aid of tracking data, with some rather blocky elements. What you are really augmenting is the 3D map of the room, so you can hang virtual pictures on virtual walls, but that map is basically one fixed object that cannot change during use. You can neither move objects, so changing the color of your chair and then pushing it to the side wouldn't work, nor can you augment any objects you interact with, like placing an image on a cup.

    Besides the tracked hands the only real AR we have seen so far is for a few keyboards from Logitech and Apple, which can actually be tracked based on their regular shape and key layout and therefore be moved. These will be overlaid with images of the letter for each key, making them readable despite the lowres b/w passthrough on the Quest 2. And with Meta giving developers access only to the abstract 3D map of the room, no app can actually interact with any real object and in any way augment them, which I would consider a condition for calling it AR.

    And the single lens is only for color, there are still multiple, stereoscopic nIR cameras for tracking, providing brightness data. The Quest Pro creates the stereoscopic passthrough by recoloring the b/w stereoscopic image with data from the monoscopic RGB camera, plus applying some geometry corrections. So far the Pico 4 only uses the monoscopic RGB image, shifted slightly for each eye, but it could assemble a true stereoscopic RGB passthrough the same way as the Quest Pro with updated software. I'd imagine that this basically is done with rather simple shaders, so my guess is their current fake-stereoscopic passthrough has more to do with their software development being still in progress than the extra performance the Quest Pro would offer thanks to the XR2+.

- *Ad*
  What it actually needs is real passthrough MR.

  - *ViRGiN*
    Why did you stop posting your propaganda about vr software?
    There are hundreds of games to be discovered! Why did you gave up?

- *Andrew Jakobs*
  If Pico can pull hand-/eye-/facetracking and AR off with their Pico 4 enterprise with the same precision as Meta, it sure will be a good option which is much cheaper, BUT the Quest Pro does have the advantage of the XR2+.

  - *Christian Schildwaechter*
    It is currently extremely hard to compare the two. Technically they seem similar, but besides the optics/resolution, it is very difficult to tell how the new features will work and what they will require. It might turn out that eye tracking is comparable as long as you restrict it to gaze detection for selecting objects or correct eye rotation. ETFR could work better or at all on the Quest Pro thanks to the added processing power, or it could be mostly useless on both. The Quest Pro has to process ten camera feeds compared to eight (?) on the Pico 4 Enterprise, which might eat some of the increased performance, but deliver (noticeably?) better results.

    And the Quest Pro might tightly lock down access to sensor data due to privacy concerns with companies using it for VR conferencing, while Pico might give access to them, allowing developers to create apps not possible on the Quest Pro, even if the Pro ends up having the better sensors and the more advanced software to run them. The things that make the Quest Pro or Pico 4 Enterprise interesting (at least to me) are those that enhance them over Quest 2/Pico 4 beyond the more easily comparable resolution, optics and comfort, the price of the device is only part of the calculation. Which of the features turn out to be actually useful and usable is another part, and it will take some time and reviews to get this sorted out.

- *Cooe*

  The Pico 4 Pro/Enterprise's face tracking & passthrough capabilities aren't even CLOSE to those on the Quest Pro (less cameras, less sensors, less sensor types) so you can't really claim they are directly competitive products. The Pico DOES make the Vive Focus 3 look freaking stupid though. The Focus 3's (& the Vive Pro 2's) RIDICULOUSLY high resolution LCD panels are completely wasted by the AWFUL fresnel lenses HTC are using.

  - *Andrew Jakobs*

    Uhm, have seen the handson video's already of the Quest Pro? It's said that the Quest color passthrough is just awful, but that's because it is using the color camera purely for color information which then is applied through an algorithm to the black and white camera's. Yep, Pico's color passthrough is only 2D at the moment, but it is vastly superior to the color passthrough of the Quest Pro, and maybe Pico can do the same trick as the Pro does and use the color information and information of the other camera's to do a stereoscopic color passthrough, which will ofcourse be just as crappy as the Quest Pro version.

  - *ViRGiN*

    anything htc/vive was always fking stupid.

- *Sean*

  I like it!