

DepthIQ™

At-a-Glance

DepthIQ from AIRY3D is a simple and versatile 3D imaging solution to generate near-field depth data from a single camera. It can be deployed to a much wider range of applications than current 3D imaging solutions, at a fraction of the cost, resources, and power requirements.

Simple:

- Single-sensor 3D imaging
- Drop-in for 2D CMOS sensor
- Single-capture aligned 2D+Depth
- Low computing resources
- No increase in data bandwidth

Versatile:

- Easily add to existing hardware
- Suitable for most image sensors
- Deployable in a wide variety of use cases

"AIRY3D's novel technology is unrivaled by any other player in the 3D sensor space. The company has immense potential in many different markets, such as Augmented and Virtual Reality, automotive, drones, and robotics. We believe in the capabilities of this technology to disrupt various billion-dollar markets."

Jeff Yu

Investment Principal at Robert Bosch Venture Capital GmbH

A simple and versatile solution for 3D Sensing

No mainstream sensor technology can deliver both depth and quality 2D images in a single device. Stereo vision provides 2D images, but individual cameras do not measure depth. Consequently, it requires multiple components and heavy computation, leading to significant compromises.

Our advantage begins with light itself

The ideal 3D sensing solution would be a single-sensor system that directly measures depth without excessive computational or manufacturing complexity. AIRY3D's DepthIQ platform uses a Transmissive Diffraction Mask (TDM) to directly generate a unique dataset of an inherently registered 2D image and depth information. AIRY3D's proprietary algorithms bring this complete data to life, eliminating the computational complexity involved in image reconstruction and depth mapping.

DepthIQ offers

Single Sensor, 3D Solution

DepthIQ is underpinned by a TDM coated over a CMOS image sensor using standard semiconductor technology, allowing for streamlined mass production. TDMs take advantage of diffraction to measure depth. Due to its single-sensor nature, DepthIQ does not suffer from stereoscopic occlusions, making it an ideal short-range solution. This unique and globally patented solution can transform any CMOS imaging device into a 3D sensor for cameras used in numerous applications such as ADAS, security, robotics, AR/VR, and IoT.

Significantly Lower Hardware and Computational Costs

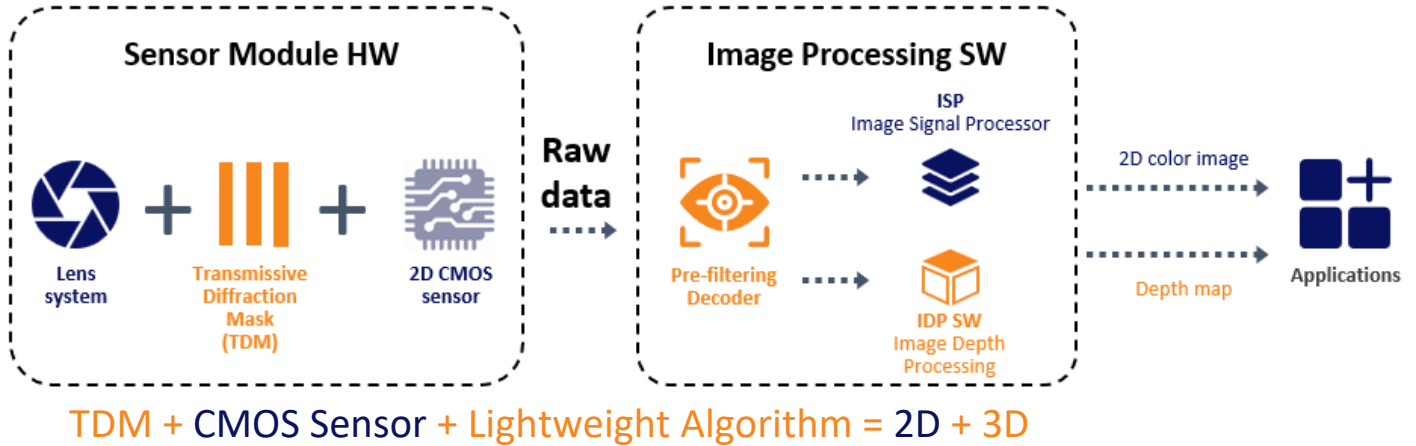
Currently, developing a 3D system is complex. DepthIQ is a drop-in solution for existing CMOS sensors that requires no change to other hardware or assembly. Computational processing is fast and uses minimal power. Both the image and depth information are contained in a single raw capture, without requiring comparative analysis between multiple images. In contrast, competing solutions rely upon several components (e.g., infrared emitters and receivers; multiple cameras) that create a higher bill of materials, manufacturing complexity, and high computational demands.

Small Size

Today's consumers expect their camera systems to have the latest features with the smallest footprint possible. This requirement places a heavy burden on manufacturers and their suppliers to deliver the highest quality and functionality with the fewest number of parts. To this end, DepthIQ minimizes the number of components and manufacturing complexity, which improves reliability. It is customizable to any given sensor specification with effectively no increase in the size of the camera sensor stack.

The DepthIQ difference

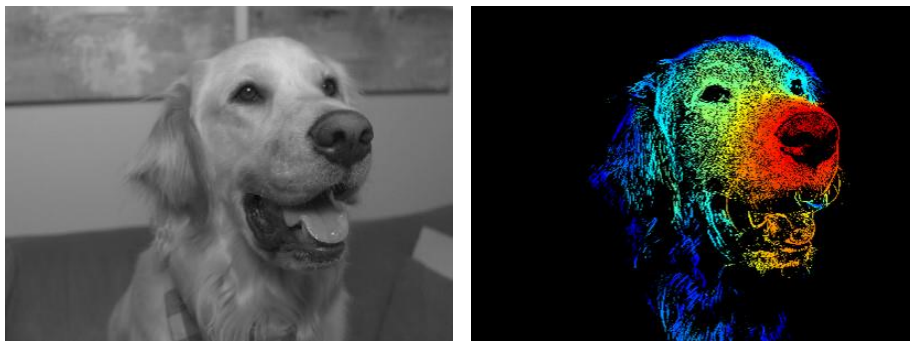
DepthIQ can be applied to any existing 2D solution, bringing 3D to your application while preserving your image pipeline.



Transmissive Diffraction Mask (TDM) This unique optical layer encodes the direction of light so that angular data is embedded into the raw image. The TDM is only a few microns thick and can be added to almost any image sensor.

Pre-filtering Decoder The lightweight software separates the encoded data from the full-resolution raw image, feeds the 2D image to any ISP and provides angular data to the IDP software.

Image Depth Processing (IDP) This software converts angular data from the TDM into a high-resolution depth map. The IDP is low-latency and the depth map can be provided synchronously with the 2D image produced by the ISP.



2D Image and Depth Map

Find out more

Email us at info@airy3d.com for a summary of our demonstration videos.

DepthIQ is a trademark of AIRY3D.

