Reasons for Choosing iReal 2E Handheld Color 3D Scanner

As the markets of 3D printing, metaverse, and 3D display expand, the demand for 3D models is growing fast. High-tech 3D scanning, an important source of creating 3D models, is becoming more popular among enterprises, schools, scientific institutions, 3D designers and 3D printing engineers.

It is because these professional 3D scanners are easy-to-use and cost-effective, with their prices ranging from $1,000 to $12,000. Additionally, they can deliver scanning results with decent accuracy and precision that can meet the requirements of data acquisition in most cases.

So, what factors should be considered in choosing a professional handheld 3D scanner?

In this article, we will talk about five factors, namely, price, objects to be scanned, environmental adaptability, material adaptability, and ease of use. We will also evaluate iReal 2E in a five-star rating system from these five aspects.

1. Price

It is important to choose a 3D scanner with a high cost-performance ratio within your budget. Professional 3D scanners generally fall into two categories, desktop and handheld devices.

BEST CHOICE

Professional Handheld Color 3D Scanner
iReal 2E

3980$
New Price in 2022

√ **Infrared VCSEL Technology**
√ **Invisible Light Scanning**
√ **Hair Scanning**
√ **Smooth Scan and Easy to Operate**
√ **Outdoor Scanning**
√ **Accuracy up to 0.1mm**
√ **4 Scanning Alignment Modes**
(Features, texture, markers and mixed)

Notes: Shipping, VAT, tariff and others are not included in the Ex-Works price of 3980$.
iReal 3D reserves the right of final interpretation.

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Desktop scanners are suitable for 3D scanning objects in a size range of 10-40 cm. Due to their limitations in measurement range, we will not discuss this kind of 3D scanner here.

Table 1: Price Range of Different Types of 3D Scanners			
	Consumer-grade Handheld 3D Scanner	Desktop Raster 3D Scanner	Professional Handheld Color 3D Scanner
Price Range	$300-600	≥$1,000	$4,000-12,000
Suitable for	Individual tasks with no strict requirements for accuracy and precision.	Art & design objects with sizes ranging from 0.1 m to 0.4 m.	Art & design objects with sizes ranging from 0.2 m to 5 m, and industrial design objects with accuracy requirements around 0.3 mm/m.

iReal 2E: ★★★★★

iReal 2E, one of the representative products of professional handheld 3D scanners, features a high scanning precision (basic accuracy up to 0.1 mm and alignment accuracy up to 0.3 mm/m) and a resolution up to 0.2 mm.

It's equipped with standard HD color scanning modules that can meet most requirements for scanning medium and large-sized objects and the human body.

iReal 2E, with a price of 3,980 dollars, stands out among its competitors (most of them range from $4,980 to $8,000).

2. Objects to be Scanned

The design inspirations of 3D designers are diverse. Therefore, a scanner, which can be used for a wide range of applications, can help them to achieve their design intent better.

iReal 2E: ★★★★

Hybrid Alignment Modes

iReal 2E offers powerful alignment abilities, supporting four different alignment modes: feature, texture, marker, and mixed.

The features alignment mode can be used for scanning sculptures with rich geometric features or scanning human body.

Texture mode is suitable for plane surfaces like walls, while markers mode can be used to scan a whole car or a set of castings. For objects with a number of diverse textures and features, the mixed mode can be used.


Size Range of the Objects to be Scanned

The minimum point distance of iReal 2E is 0.2mm (the smaller the point distance is, the finer the 3D model will be). Its ideal size range for the objects to be scanned ranges is between 0.3 and 4 meters. It is also capable of 3D scanning smaller objects between 0.1 and 0.3 meters if the requirements on precision aren't very high.

By setting the resolution at 1.0 mm or higher, users can capture data of objects larger than 4 meters. The task can be fulfilled when the user's computer configuration is good (64GB/128GB of RAM) and the requirements for details and precision aren't high.

An Engineer from Scantech has 3D scanned a Mercedes-Benz GLA SUV (approximately 4.3 meters long and 1.7 meters wide) in the marker alignment mode. The global accuracy for the car scanning is about ±1 mm.

iReal 2E is fully capable of scanning large and medium-sized objects. The 3D data captured can be applied in game digital assets, 3D display, virtual simulation, etc.

3D Scanning A Mercedes-Benz Car with iReal 2E Handheld 3D Scanner
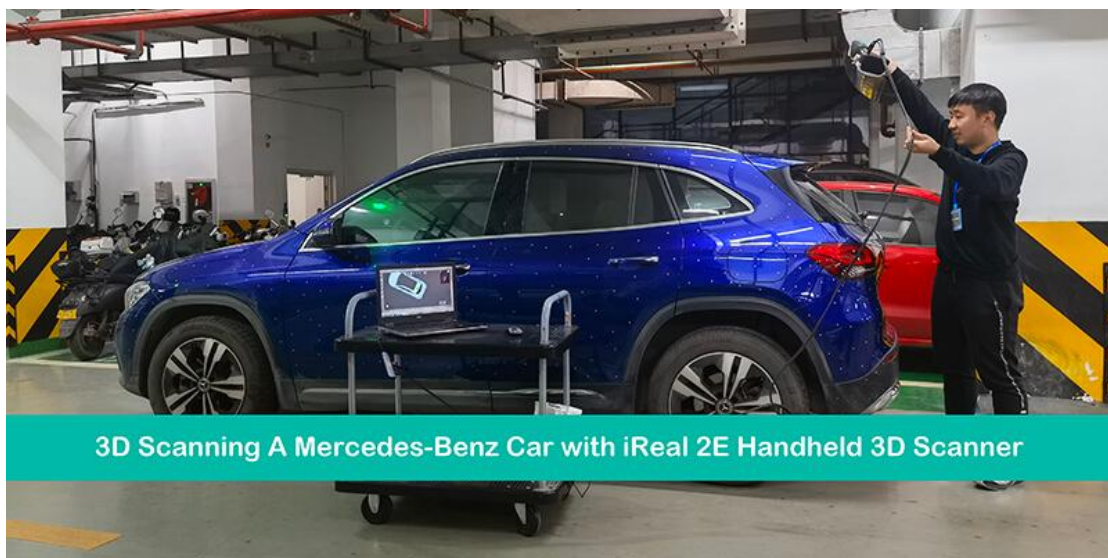
For Both Art and Industrial Design

One of the biggest advantages of professional 3D scanners is that they can align scans by features instead of makers.

This kind of 3D scanner is mainly used in the data acquisition of sculptures, artworks, body parts, and portraits. These applications are more in line with the needs of 3D designers.

When 3D engineers engage in reverse engineering, virtual simulation, and game asset creation of industrial products, they require a relatively high level of detail and precision.

iReal 2E offers quasi-industrial accuracy, good data restoration ability, and marker alignment mode.

It is capable of meeting the requirements for designing industrial products such as castings, bathroom products, and automobile repacking under limited budgets.

Note: Laser scanners from Scantech are recommended if you have strict needs for size accuracy, curved surface precision, and accuracy consistency.

3. Environmental Adaptability

The environmental conditions in different 3D scanning tasks vary. A 3D scanner with a strong ability to adapt to different environmental conditions allows designers to obtain data anytime and anywhere.

iReal 2E: ★★★★★

Engineered with infrared VCSEL structured light technology, iReal 2E boasts great adaptability for different light conditions.

It is capable of successfully capturing 3D data in a luminous indoor setting, under direct sunlight outdoors, or in a bright or dark environment.

4. Material Adaptability

Handheld 3D scanners generally can capture data of matt and light-colored surfaces (because the projected light diffuses well). These scanners generally have trouble capturing surfaces that are transparent (because the projected light penetrates the surface), reflective (because the light reflects off the surface), or very dark surfaces (because the light is absorbed). Different types of 3D scanners have different material adaptability. For those 3D scanners with poor material adaptability, spray powder is often required to obtain better point cloud data.

iReal 2E: ★★★★

iReal 2E adopts linear-array structured light technology to gain better material adaptability to scan more items without powder and creatively solve the difficulty of hair scanning. Thanks to iReal 2E's unique decoding algorithm, it has stronger adaptability to colors. It can scan objects with sharp contrast without resetting exposures, which makes it easier for users to operate the scanner.

Note: Scanning powder is required for iReal 2E when scanning transparent, specular, and euphotic materials. Industrial laser scanners from Scantech can easily deal with the dark and reflective surfaces without powder and get high–quality point clouds.

5. Ease of Use

Most professional 3D scanners use features to align scans. It requires users to know how 3D scanner works and how to operate, which is not easy for beginners.

A scanner with a large field of view and depth of field offers operators more freedom of operation. This kind of easy-to-use 3D scanner can be suitable for beginners.

iReal 2E: ★★★★★

Thanks to its large field of view (scanning area of 580*550 mm) and a 720-mm depth of field (scanning distance from 280 mm to 1000 mm), iReal 2E offers people true freedom to 3D scan.

Friendly UI design helps users to post-process scanned data easily, and the scanning experience is further improved by versatile features such as a smart colormap and compatible resolutions set.

Conclusion – Infrared VCSEL Technology is More Friendly to Users

Generally, professional handheld 3D scanners are those designed with structured light. These kinds of 3D scanners use structured light-pattern decoding technology, a method of optical measurement based on the principle of triangulation. It projects aperiodic and random digital patterns onto the objects' surface and the pattern is distorted by the surface.

Due to the randomness of the digital pattern, the height information of any point on the surface can be uniquely determined by the tiny area of the pattern image, so that the 3D information of the surface of the object can be accurately measured.

There are two common light sources for structured-light 3D scanners: LED and VCSEL. LED light performs better in capturing details as the pattern projected with LED is clearer than that of VCSEL.

However, there are several disadvantages about this technology:
- LED light 3D scanner with smaller scanning area and depth of field may cause difficulty in data alignment;
- Scanning powder is required for most of the reflective and dark surfaces due to their poor material adaptability;
- Hard to scan hair;

- Difficult to scan under direct sunlight;
- LED light is uncomfortable for the scanned person.

Products with different technical principles have their own advantages and disadvantages. Three-dimensional designers can choose the most appropriate 3D scanners for themselves.

If you are planning to scan the whole human body, body parts, or medium and large-sized objects, iReal 2E with invisible and infrared VCSEL light is your choice.

Its invisible light is safe for eyes and it can offer comfortable scanning experiences. Besides, it is cost-effective, highly adaptive, and easy to operate. iReal 2E could bring you a more friendly 3D digital experience and it's your first choice in professional handheld color 3D scanners.

About iReal 2E

iReal 2E maximizes the performance in depth of field, scanning area, algorithm, texture reproduction, and detail capturing, specially designed for medium to large-sized objects and human body 3D scanning.

iReal 2E adopts the infrared VCSEL structured light technology to bring you the safest and most comfortable 3D scanning experience. Without attaching markers, a quick texture capturing and geometry acquisition can be achieved. Its hybrid alignment modes can meet various scanning situations.

iReal 3D is a sub-brand of Scantech, a company that specializes in developing, manufacturing, and selling portable 3D scanners. iReal 3D offers clients more professional 3D digital solutions to meet various requirements in different fields including but not limited to 3D printing, digital cultural relics, digital sculpture, art and design, medical rehabilitation, body art, clothing customization, mechanical reverse engineering, VR, AR, education and science and research.

By focusing on developing professional 3D scanners and taking advantage of 3D digital tools like 3D printing and 3D software, iReal is dedicated to creating endless possibilities for 3D digital applications.

For more information, please visit www.ireal3dscan.com