



LMI TECHNOLOGIES

Choosing the Right 3D Scanner to Make Your Project a Success

For most people, purchasing a 3D scanner is a new experience.

This process is complex and confusing since each 3D scanning system has its own features and uses different technologies (ie. laser, white-light, and stereovision).

Out of all the 3D scanners that currently exist in the market, which one is right for you?

3D scanning is a technology that can help you accomplish a task. Which scanner configuration is best suited for your particular application really depends on your needs. Therefore, the first step is to define what you want to achieve. Otherwise you will have no method to evaluate whether the 3D scanners you are considering will meet those requirements.

Here are key questions you need to answer to help you with this process

1. What are you trying to scan?

Defining what you want to scan will determine what features are important when evaluating 3D scanners. For example, a 3D scanner that is great at scanning human faces might not be good for scanning buildings. The more specific you are at defining you want to scan, the easier you will be able to find a 3D scanner that suits your particular application.

2. What is the **size** of the target object?

Most 3D scanners are optimized for a particular scanning window or object size. Typically, you would need to use different scanners to scan objects of different sizes. For example, you would use a different 3D scanner for scanning piece of jewelry versus scanning a car. Most 3D scanners are optimized to scan objects from approximately a few inches to two feet. The further you go from this standard size, the higher the price the 3D scanner will likely be.

3. How much accuracy are you looking for in a scan?

Accuracy is the quality of being close to the true value of the object. It is usually defined as Z or depth accuracy. Although X and Y accuracies are sometimes specified, Z accuracy is the number most mentioned on a 3D scanner's specification sheet. This question is critical because accuracy will have a significant impact on price of the scanner. High accuracy is appealing to everyone although it is the single largest factor influencing cost. A 50 micron 3D scanner may only cost \$10,000 compared to a 5 micron 3D scanner that might cost upwards of \$150,000. Go with lowest accuracy you can tolerate as that will generally minimize the cost of the 3D scanner.

4. How much **resolution** are you looking for in a scan?

Resolution measures the amount of detail you want to acquire from the object you are scanning. You can have a very accurate 3D scanner that only collects 10 points in a single scan or a very inaccurate 3D scanner that collects millions of points. Each of these 3D scanners serve a different purpose. Like accuracy, the amount of resolution you need will have a direct effect on the price of the 3D scanner. Higher resolution scanners that capture more detail will cost more.

5. How **fast** do you need the
3D scanner to scan?

For scanning of static objects, the scan time usually does not matter as much unless you are doing dozens of scans. A single scan that takes under a minute is acceptable for most people. For the scanning people, faster the scan speed is required because it is difficult to stand still for long periods of time. A scan speed of 1.5 seconds or less would be best. You need to consider that processing the resulting scan data also takes time, and faster processing speed is generally associated with higher cost.

6. What do you plan to do with the data once you finish 3D scanning?

For most projects, 3D scanning is the first part of the project. Scan data is ultimately used for other purposes, whether it is CNC to mill out an object, for visualization or inspection. The downstream data path is different for various applications. This helps to determine the features you need in a scanner and what other data processing software you will need to complement the scanner. Once you have your 3D data, there are data cleanup and data conversion tasks that need to be done in other software packages.

7. What is your scanning environment?

Every 3D scanning system has an ideal scanning environment. Most 3D scanners work well in an office lighting environment. All other environments add additional challenges to the equation. If you want to do 3D scanning outdoors or in a moving vehicle, that will add a level of complexity to the project. If you are able to scan in normal scanning environment you should be able to purchase less expensive equipment than if you need a system that can scan in special conditions.

8. What is your budget?

Ultimately, there is no point in finding out that you need a million dollar machine with a \$5,000 budget. Sometimes you need to trade off some features in order to fit your budget and find away to "make do" with less features. Prioritizing the features will make your job less difficult.

9. Who will be **operating** the scanner?

It is easy to forget that 3D scanning is a complicated task that requires training. Give a top of the line digital camera to a novice will result in poor pictures. However, give the same equipment to a professional photographer and you will get award winning results. The same applies to 3D scanning equipment. If the operator has no previous training in 3D scanning it doesn't matter how much the equipment costs because they can't generate the results the equipment is intended to produce.

Learning how to use a 3D scanner takes time. No one can become an expert overnight (or within a few hours). You need to invest time learning the system that will reward you with good scan results.

10. Do you need any specific features?

Sometimes you might want special features that are not included in a basic off-the-shelf 3D scanner like color texture capture, rotary table, or integration with a particular application. Most 3D scanning companies are able to accommodate your request but extra cost would be involved.

It is always important to talk to a 3D scanning specialist like [LMI Technologies](#) about these questions as every project has their own requirements. We can discuss the different options available for your scanning project that will make it a success.

About LMI Technologies

At LMI Technologies, we are passionate about developing innovative 3D scanning, measurement, and data visualization technologies that solve complex problems in a simple way. From concept and design, to manufacturing, we build our products from the ground up. We take our knowledge and experience from working in the field and connect our customers to 3D solutions that enable them to achieve better business results.

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