ESCAN-3 3D Laser Scanner Technical Proposal

1. Instruction

Hangzhou Scantech Co., Ltd is a high-tech enterprise which was composed of industry experts, returnees Doctors and high-tech youth talents. It located in Zhejiang overseas high-level talent innovation park. Hangzhou Scantech mainly engaged in the developing, manufacturing and selling of the intelligent visual inspection equipment such as portable 3D scanner and 2D laser sensor. Leading by the returnees Doctors, the R&D team developed a series of mechanical and electronic products which possess the proprietary intellectual property rights. The portable 3D scanner, global photography measurement system and 2D laser sensor are also the foremost equipment in the country. These products have been widely used in colleges, research institutions, automobile industry, large-scale machinery enterprise and modeling design company, and have enjoy great reputation in the market.

2. Product instruction

2.1 Overview

ESCAN series portable 3D scanner are developed by Hangzhou Scantech Co., Ltd. It adopts multiple beam laser to obtain the three-dimensional point from object surface. Operator can hand-hold the device and adjust the distance and angle between the scanner and measured object timely. It can cooperate with the global photography measurement system when scanning the large piece object to eliminate the accumulated error and improve the global scanning accuracy. The scanner can also be conveniently carried to industrial field or production workshop, and scanned the object efficiently and accurately according to its size and shape.

2.2 Operating principle

(1) Two cameras on the scanner can respectively obtain the projection laser on the measured object. The laser would occur deformation according to the measured object. The linear three-dimensional information can be acquired by calculating, as two cameras are accurate demarcated in advance.

(2) The device identifies the scanner’s position according to the fixed visual markers during the process of scanning, and the position is used on spatial location conversion.

(3) When the scanner moved, the three-dimensional position information where the laser went through can be acquired by utilizing the linear 3D information and relative space position. And thus form a continuous 3D data.

2.3 Software functions and technical features

- Three parallel laser lines and scanned quickly
- Automatically generate the STL triangular mesh surface, and the data can be processed rapidly as the format is STL.
- The scan software can automatically process the point cloud data such as select, delete, remove the isolated point and non-connected one, smooth filtering, feature merge, etc.
- The software possesses functions such as set the distance between scanning point, adjust the laser intensity and adjust the scanning angle.
- Device can be quickly calibrated.
- Pressing the button and the scan state could be transformed between three cross laser lines and a single laser line. Three cross laser line can realize the rapid scanning, and the single laser line can implement the optimized scan of the blind angle and deep hole.
- The scanned object does not need to be fixed.
- The target point automatically orientates and needs no additional mechanical arm or other tracking device.
- Connect by the Gigabit Ethernet cable and support work over a long distance.
- It possesses two high resolution image acquisition unit and a laser transmitter.
- Automatically generate the 3D solid graphics (triangular mesh surface).
- The handheld device could be carried with the personnel. And the weight is less than 1kg.
- The device can scan at outside as well as inside. It could also scan in a narrow space such as scan the cockpit and the car interior dashboard. Multiple equipments can scan at the same time. All the data are in the same coordinate system and don’t need to match it.
- Through the selection of the point cloud density to control the size of the scan file. Scan different parts according to the relative detail requirements.
- The external environment has little effect on the scanning accuracy. Even exposed to direct sunlight could the canner work normally.
- The scanner can easily deal with the car paint mirror surface as well as other black surface. Mostly, the imaging enhancement is unnecessary.

2.4 Parameter

Chart 1 technical parameter

Type	ESCAN-3
Weight	0.85kg
Dimensions	300*145*105mm
Light source	Three parallel laser lines
Scan rate	125.000 measures/s
Laser class	Ⅱ (eye-safe)
Resolution	can be customized according to user's requirement ，and can be minimum to 0.06mm
Accuracy	Up to 0.06mm
Volumetric accuracy 1 （use the scanner individually）	0.03mm+0.15mm/m
Volumetric accuracy 2 （with the global photography measurement system）	0.03mm+0.025mm/m
Stand-off distance	300mm
Depth of field	250mm
Output format	.ply、.xyz、.dae、.fbx、.ma、.obj、.asc、.stl. it can be customized according to user's requirement
Work temperature	-10~40℃
Interface mode	★Gigabit Lan
PC requirements	CPU：i7-4710MQ（Gainestown 2.5GHz） RAM：32G，1600MHzDDR3L GPU：NVIDIA Quadro K2100M 2GB GDDR5 Operating system：Windows 7-64 bit, Windows 8 Connector ：Gigabit lan port
Fast calibrate	The software support fast calibrate, and the time can be within one minute

2.5 Application

- Automobile manufacturing
- Aerospace
- Power generation
- Model manufacturing
- Casting inspection
- Construction machinery
- Design inspection
- Architecture sculpture
- Colleges and research institutes

3. Configuration

The production capacity of portable 3D scanner is about 300 to 400 sets per year. The accessories are adequate and can deal with the emergency situation.

Chart 2 standard configuration

Product	Quantity
3D scanner hand-held terminal	1 set
Calibration target	1 set
Combination cable	1 piece
Power adapter	1 piece
Reflective marker	4000 pieces
Waterproof case	1 set
Three-dimensional scan software	1 set

4. Training and after-sale service

4.1 Training

We will provide the training such as device usage, adjusting and daily maintenance till the personnel can operate it. And the customer can choose the place to do the training. In addition, we will provide the technical support if you meet the technical matters after the equipment delivery.

4.2 Warranty

We promise a one-year warranty for the sold ESCAN portable 3D scanner. No matter in the warranty period or not, we will respond the repair notification in 12 hours, and provide the technical support. We will provide the solution in 24 hours and try our best to deal it.

The calibration service is free during the warranty.