

Features & Technical Specifications



Features

United Science's *eFit Scanner* is not only the most accurate means for capturing a 3D scan of the entire ear, it combines one of the world's most accurate laser scanners with an industry leading 3D tracking system.



Sample rendering showing full canal and concha scan

Hand-Held Scanning Operation – For the operator the process is similar to painting the ear canal and pinna with light. The scanner operates at 15 frames per second, with each section of scan data captured in 0.01 seconds - fast enough that any head movement or hand jitter is automatically captured and resolved by the scanner.



The eFit Scanner System fits within 25 sq.ft

Accuracy – The scanner has a volumetric accuracy of $\pm 90\mu\text{m}$. For perspective, both a human hair and a sheet of paper are about $100\mu\text{m}$ thick. That means if you laid a sheet of paper on a flat table, we could tell you the thickness of the paper. See our case studies enclosed.

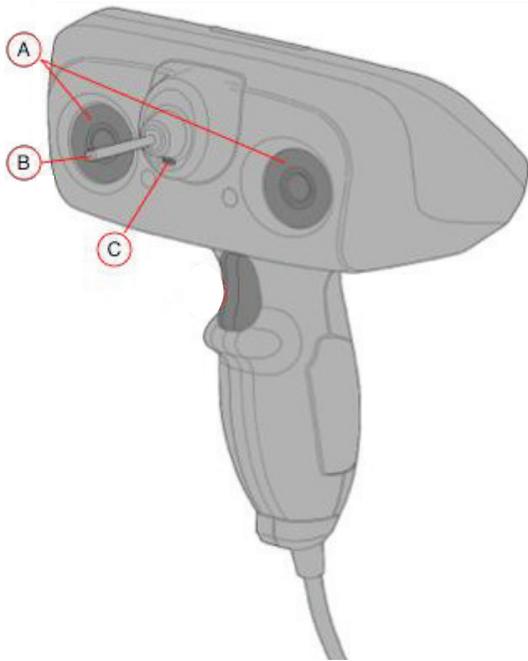
Real-Time Feedback – The operator is presented with a real-time view of the collected scan data. During a scan, and before the customer leaves, the operator is automatically presented with scan completeness. The operator has the opportunity to review and add to the scan at any time if necessary.

Scan Speed – A complete scan can be as quick as 90 seconds per ear.

Automatic Cradle Validation – Every scan is accurate, every time. The scanning system performs a self-validation before allowing the user to proceed with a scan.

Training Procedure – Users can be trained during a single training course. Users train on both rubber and human ears before training is completed.

Features



Three Scanning Systems = Easy Ear Scans

United Sciences created three laser-scanning modes, which enables the user to quickly capture every important surface of the entire ear. Scanning the ear is as easy as A, B, C.

A: Industry Leading 3D Tracking – The eFit scanner’s tracking system was purpose-built for ear scanning, achieving unmatched accuracy, resolution, speed, working range, working angle, and mobility.

B: Ring Scanner – A live view of the ear canal is used to guide the user through a complete ear canal scan using a ring of blue light at the tip of the device probe.

C: Line Scanner – A line of laser light is projected from the scanner and is used to capture a majority of the outside of the ear, quickly and easily.

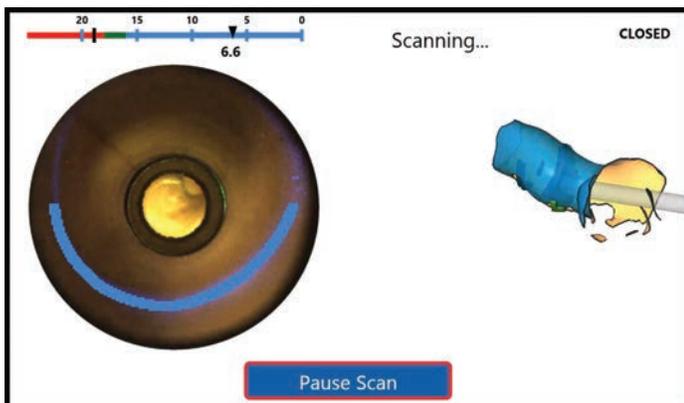
Safety – eFit is the safest way to capture the true dimensions of the ear, eliminating silicone blowby risks.

Non-Contact – The scanning data is acquired with a non-contact laser scanning system.

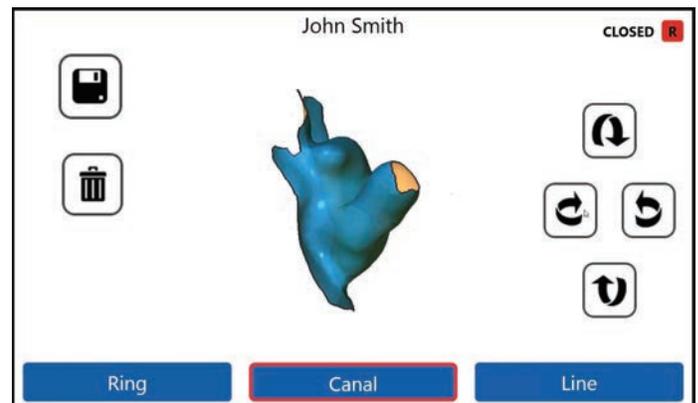
Video Otoscope – The operator is presented with a real-time view of the ear and ear canal, which is used to guide the operator to a safe and complete scan.

Depth gauge – The eFit scanware provides real-time estimated tip location and depth information to the operator, as well as a configurable depth target, warning message, and alarm.

Ear-Protect Nose – The Ear-Protect Nose allows for an easy scan of the entire ear, while minimizing overly deep scans.



Example of video otoscope, depth gauge, and 3D canal reconstruction



Example of final 3D scan

Technical Specifications

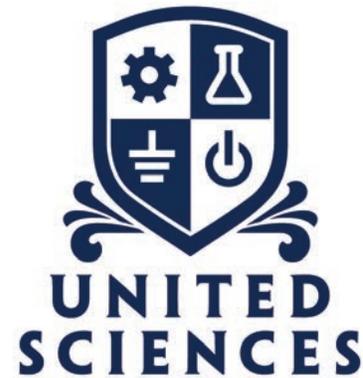
Scanner Specifications

Sensor	3 CMOS Digital Image Sensors
Frame rate	15 frames/sec.
Input Power	5V USB 3.0, Max. 900mA
USB Plug	USB 3.0, Type A
Output signals	USB 3.0
EMC	EN 55011, EN 61000-3-2, EN 61000-3-3
Class 2 Laser Product	EN 60825
LED Photobiological Safety	EN 62471
Storage Temperature	-20°C to +60°C (-4°F to +140°F)
Operating Environment Temperature	+10°C to +30°C (+50°F to +86°F)
Air Humidity	30% to 75%, non-condensing
Air Pressure	600 hPa to 1060 hPa
Accuracy	90µ Volumetric Accuracy (0.09mm)

Manufacturer

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Detailed Specifications

Guidance and manufacturer's declaration - electromagnetic emissions for all equipment and systems		
eFit is intended for use in the electromagnetic environment specified below. The user of eFit should ensure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	eFit uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	eFit is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions EN 61000-3-2	Not applicable	
Voltage fluctuations/flicker emissions EN 61000-3-3	Not applicable	

Guidance and manufacturer's declaration - electromagnetic immunity for all equipment and systems			
eFit is intended for use in the electromagnetic environment specified below. The user of eFit should ensure that it is used in such an environment.			
Immunity test	test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) EN 61000-4-2	+/- 6 kV contact +/- 8 kV air	+/- 6 kV contact +/- 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Power frequency (50/60 Hz) magnetic field EN61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Note • U _i is the AC mains voltage prior to application of the test level.			