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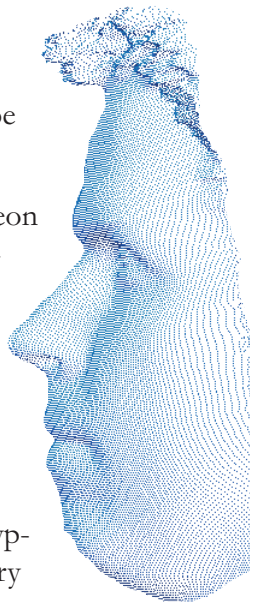
Rainbow 3D
By Genex Technologies

RAINBOW 3D TECHNOLOGY

The Rainbow 3D® uses a revolutionary visible light capture technology to create precise 3D digital images. Each image contains full-frame, dynamic data, meaning that the Rainbow 3D encodes all of the object's geometry with one snapshot that can be manipulated in real-time.



The camera integrates with Genex's advanced 3D Mosaic™ for engineering or 3D Surgeon for medical applications software. This suite allows users to view, edit, manipulate, measure, compare, compress, overlay, and output accurate 3D digital models.

One 3D image contains exact coordinates of the entire visible surface of an object. This quantitative 3D measurement data enables users to perform high-fidelity image capture, measurement and computer-aided design. Images may also be exported into popular third-party software packages.

Applications for the Rainbow 3D system include commercial engineering (rapid prototyping, reverse engineering, customized sculpting) and medical work (clinical studies, surgery planning, research).

Rainbow 3D Features and Benefits

- **Exceptional Performance:** Acquires a highly accurate, full-frame 3D image in less than a second with Genex's patented capture process
- **User Friendly Interface:** Allows fast training while keeping rich functionality and powerful manipulation capabilities
- **Real-time 3D Digitization:** Encodes and sends 3D data to a computer instantly
- **Image Processing Efficiency:** Provides full-frame 3D data with one image
- **High Spatial Resolution:** Yields micron-level accuracy that is theoretically infinite, and practically limited only by the image sensor (currently 640 by 480 points per frame, yielding 307,200 max points).
- **Eye-safe Technology:** Uses no lasers, avoiding eye-safety issues
- **Low Maintenance:** Avoids sensitive mechanical parts by taking a picture instead of scanning
- **Realistic 2D Image Overlay:** Captures a high-resolution 2D image simultaneously and maps it onto the 3D model precisely
- **Remarkable Value:** Employs a simple design and off-the-shelf components to keep costs low and technology current
- **Small Camera Size:** Fits into small rooms with a minimal footprint, making our solution portable and adaptable to any environment

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PRODUCT CONFIGURATIONS

The 3D FaceCam® 500 and 800

The 3D FaceCam system is optimized for wide coverage applications such as capturing multiple faces. The 500 model has a field of view of 510 by 400 mm and an accuracy rating of 600 microns. The 800 model has a field of view of 890 by 700 mm and an accuracy rating of 900 microns. High-resolution color texture data capture is available as an option.

3D FaceCam and Rainbow 3D camera platform: Genex's systems leverage a shared technology platform with varying configurations.

The Rainbow 3D® Camera 250

The Rainbow 3D Camera 250 is designed for capturing large objects in 3D such as full facial images or art objects. The camera has a field of view of 250 by 200 mm and an accuracy rating of 250 microns. High-resolution color texture data capture is available as an option.

The Rainbow 3D® Camera 100 and 50

The Rainbow 3D Camera 100 and 50 are designed for capturing small objects in 3D such as manufacturing parts, small facial areas, or art objects. The Rainbow 100 camera has a field of view of 100 by 80 mm and an accuracy rating of 100 microns while the Rainbow 50 has a field of view of about 60 by 50 mm and an accuracy rating of 50 microns. High-resolution color texture data capture is available as an option.

The Rainbow 3D® Camera 25

The Rainbow 3D Camera 25 is designed for capturing very small objects in 3D such as manufacturing parts, jewelry, or dental casts. The camera has a field of view of 32 by 25 mm and an accuracy rating of 25 microns. High-resolution color texture data capture is available as an option.

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SAMPLE IMAGES

Please contact Genex today for interactive samples of the images below.

Rainbow 3D: Miniature bull model for reverse engineering

Rainbow 3D: Breast image taken for medical imaging

3D FaceCam: Young child photographed for a personalized gift

3D FaceCam: Crystal cube output (via laser etching system)

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MODELING SOLUTIONS

In addition to our standard 3D camera and software, we offer a 3D model-building solution. The **Genex 3D Digitzer™** is a turnkey "plug-and-play" solution that can easily be integrated into your 3D modeling process with other software/hardware for surfacing and output. The system includes all that is needed for 3D capture/model building:

- **Hardware:** 3D imaging system, computer, robotic motion stage or arm, and cables.
- **Software:** 3D Capture software that automatically controls the 3D camera and motion stage to capture, visualize, and provide 3D output for post-processing and model building.
- **Customized Solution:** Integrated and production-ready capture platform that encloses the camera and robotic motion stage in a controlled environment. Can be configured as a free-standing system or a desktop system.

While each solution is unique, the turnkey Genex 3D Digitizer system typically costs between $50,000 and $100,000. Variations include adjustments for different accuracy, configuration, and hardware requirements.

Examples of our digitizer solutions include:

Genex 3D Ear Impression (EI) Digitizer™

The EI Digitzer builds 360-degree 3D models of an ear impression in a rapid automated process. With this system, users can greatly streamline the process for producing custom hearing aid and ear devices.

Genex 3D Dental Digitizer™

The Dental Digitzer builds 360-degree 3D models of mouth impressions. This allows for much faster turn-around on custom dental retainers and other intra-oral applications.

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TECHNICAL INFORMATION

Universal Specifications

- Image Acquisition Time: 400 - 500 msec (depending on settings).
- Processing Time: 1 second for quick view, 5-30 seconds for full 3D model (depending on settings).
- 3D resolution: 307,200 (640 x 480) data points of information (max).
- Texture Overlay: Automatic registration of 2D texture information with 3D data. User option to overlay color or black-and-white (intensity) data.
- High-Res Texture Overlay (Optional): Automatic registration of 2272x1704 pixel (4 Mpixel) 2D texture information with 3D data.
- 3D Formats: GTI* (native), DXF, IGS, OBJ, PLY*, PNT* (point clouds), STL, and VRML. (* Format supports texture overlay.)
- Size and Weight: 438 mm (17 ¼”) width x 171 mm (6 ¾”) height x 356 mm (14”) depth; 9.5 kg (21 lb).
- Power: 110 - 240 volts AC.

3D FaceCam Specifications

- Field of View:
  Model 500: 510 mm (20”) width x 400 mm (16”) height x 300 mm (12”) depth.
  Model 800: 890 mm (35”) width x 700 mm (28”) height x 600 mm (24”) depth.
- Accuracy:
  Model 500: 600 microns
  Model 800: 900 microns

Rainbow 3D Specifications

- Accuracy:
  - *Rainbow 25:* 25 Microns (.0010”)
  - *Rainbow 50:* 50 Microns (.0020”)
  - *Rainbow 100:* 100 Microns (.0039”)
  - *Rainbow 250:* 250 Microns (.0098”).
- Field of View (H x W x D):
  - *Rainbow 25: 32 by 25 by 20 mm (1.3” by 1.0” by 0.8”)*
  - *Rainbow 50: 59 by 48 by 32 mm (2.6” by 2.0” by 1.0”)*
  - *Rainbow 100: 100 by 80 by 80 mm (3.9” by 3.1” by 3.1”)*
  - *Rainbow 250: 250 by 200 by 200 mm (9.8” by 7.9” by 7.9”)*
- Ideal Object Distance (Focal Point):
  - *Rainbow 25: 198 mm to 208 mm (7.8” to 8.2”)*
  - *Rainbow 50: 198 mm to 208 mm (7.8” to 8.2”)*
  - *Rainbow 100: 457 mm to 483 mm (18.0” to 19.0”)*
  - *Rainbow 250: 686 mm to 737 mm (27.0” to 29.0”)*

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TECHNICAL INFORMATION

Genex 3D Digitizer™

- Image Acquisition Time: Under one second per image capture and about 45 – 50 seconds to digitize a typical model.
- Image Processing Time: Approximately 15 - 20 seconds for full object model.
- Resolution: 442,368 (768 x 576) data points per image capture. Nearly seven million data points processed for full model.
- Genex 3D AutoScan™ Software package: Offers automated capture, motion-stage control, and processing; outputs automatically into leading software packages.
- 3D Image Formats: AC, DAT, DXF (for CAD), GTI (native format), IGS/IGES, OBJ, PNT (point clouds), STL, and VRML.
- Accuracy: Up to 25 microns.
- Auto Calibration: Genex's intelligent software automatically adjusts the motion stage to place the object in the ideal frame of view.
- Field of View (H x W x D) for each image: 2.5" by 2.0" by 1.4" (60 by 48 by 35 mm).
- Motion Stage: 2-axis motion stage capable of full 360° rotation and tilt.
- Computer: 1.6 GHz, optimized Pentium 4 computer with 256 MB RAM.
- Dimensions: H - 28 ¾" (.73 m), W - 14" (.36 m), L - 26 ½" (.67 m).
- Weight of System: Approximately 26 lbs (11.79 kg), including camera, motion stage, and work station.
- Power: 110 or 220 volts AC.

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ABOUT GENEX

Genex Technologies was established in 1995 and is 100% focused on innovations in imaging and display. We have cutting-edge solutions in the areas of 3D, 360-degree, and spatial volume imaging. We also offer state-of-the-art imaging hardware and software to provide 3D data models to allow you to quickly produce customized products for your customers. Genex's advanced imaging products are currently sold both domestically in US and internationally to countries such as the UK, Belgium, Japan, Korea, Israel, and China. Our top staff of highly educated engineers is dedicated to improving technology for 3D capture and display, meaning that your application has the attention and commitment of the leading minds in the industry.

Contact Information

For more information on Genex's exciting 3D imaging technologies, please contact us. We will be happy to discuss your specific needs.

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