Sense™ 3D Scanner

User Guide

See inside for use and safety information.

CONTENTS

1   INTRODUCTION

COPYRIGHT INFORMATION

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FCC NOTICE

This equipment has been tested and found to comply with the limits for a class "A" digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense.

COMPLIANCE

This equipment conforms with International Electric Committee (IEC) 60950-1 and (IEC) 60825-1 and meets the requirements of the applicable EC directives.

WARRANTY

3D Systems warrants that the Sense 3D scanner will be free from defects in materials and workmanship, during the applicable warranty period, when used under the normal conditions described in the documentation provided to you, including the respective User Guide. 3D Systems will promptly repair or replace the Scanner, if required, to make it free of defects during the warranty period. This warranty excludes repairs required during the warranty period because of abnormal use or conditions (such as riots, floods, misuse, neglect or improper service by anyone except 3D Systems or its authorized service provider). The warranty period for the Scanner is twelve (12) months and shall start the date Your Scanner is purchased. For consumers who are covered by consumer protection laws or regulations in their country of purchase or, if different, their country of residence, the benefits conferred by our standard warranty are in addition to, and operate concurrently with, all rights and remedies conveyed by such consumer protection laws and regulations, including but not limited to these additional rights.

THIS WARRANTY IS THE ONLY WARRANTY PROVIDED FOR THE SENSE 3D SCANNER. TO THE MAXIMUM EXTENT PERMITTED BY LAW, 3D SYSTEMS EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES FOR THE SENSE 3D SCANNER AND EACH OF ITS COMPONENTS, WHETHER THOSE WARRANTIES ARE EXPRESS, IMPLIED OR STATUTORY, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR INTENDED OR PARTICULAR PURPOSES.

LIMITATION OF LIABILITY

3D SYSTEMS WILL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, EXEMPLARY OR INCIDENTAL DAMAGES (SUCH AS LOSS OF PROFIT OR EMPLOYEE'S TIME) REGARDLESS OF THE REASON. IN NO EVENT SHALL THE LIABILITY AND/OR OBLIGATIONS OF 3D SYSTEMS ARISING OUT OF THE PURCHASE, LEASE, LICENSE AND/OR USE OF THE EQUIPMENT BY YOU OR OTHERS EXCEED THE PURCHASE PRICE OF THE SENSE 3D SCANNER.

2   IMPORTANT SAFETY INFORMATION

CAUTION: Indicates something may happen that could cause loss of data, damage to equipment, or could cause personal injury.

SAFETY GUIDELINES

- Follow all safety rules in this section and observe all cautions and warnings in this guide.

- To avoid damage to the laser projector, do not open the Sense 3D Scanner casing. Doing so will void your warranty.

- It is important that the scanner operates in the temperature ranges 5 °C and 40 °C for optimal use. Higher or lower temperatures may alter the scanner's performance resulting in the scanner malfunctioning.

- The sensor is a class 1 laser product, certified by an external party to adhere to IEC 60825 safety requirements. The Sensor is compliant with part 1 of the IEC 60825 publications - "Safety of laser products."

CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

3   SENSE 3D SCANNER FEATURES AND PROPERTIES

Sense 3D Scanner gives users the ability to observe a scene in three dimensions and then translates the observations into multiple depth images. It then takes combines those depth frames into a 3D model made up of thousands of connected triangles, called a mesh.

SENSE 3D SCANNER FEATURES

- Field of view 57.5 x 45
- VGA depth map (640 x 480)
- USB 2.0
- Color
- Standard off the shelf components
- OpenNI compliant

SENSE 3D SCANNER PROPERTIES

Scan Volume (Width x Height x Depth)

- Min: 0.2m x 0.2m x 0.2m; Max: 3m x 3m x 3m

Operating Range: Min: 0.35m; Max: 3m

Field of View

- Horizontal: 45°
- Vertical: 57.5°
- Diagonal: 69°

Depth Image Size: 240(w) x 320(h) pixels

Spatial x/y Resolution @ 0.5m: 0.9mm

Depth Resolution @ 0.5m: 1mm

4   SPECIFICATIONS AND REQUIREMENTS FOR YOUR SENSE 3D SCANNER

DIMENSIONS

- 17.8 cm x 12.9 cm x 3.3 cm

SOFTWARE

- Complimentary software for Windows.

MINIMUM HARDWARE REQUIREMENTS

- Intel Pentium or equivalent processor: 2 GHz or faster
- RAM: 2GB minimum
- 1280 x 1024 minimum screen resolution
- 4 GB available hard disk space

SUPPORTED OPERATING SYSTEMS

- Windows 7® (32-bit or 64-bit)
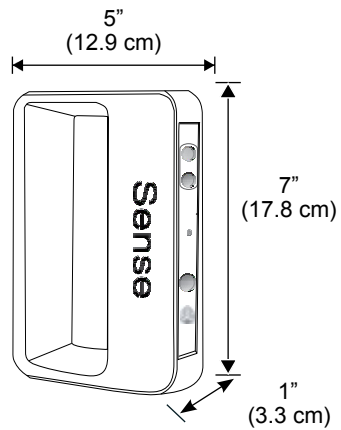- Windows 8® (32-bit or 64-bit)

DATA INTERFACE

- USB 2.0
- USB Cable (connection to computer)

ELECTRICAL
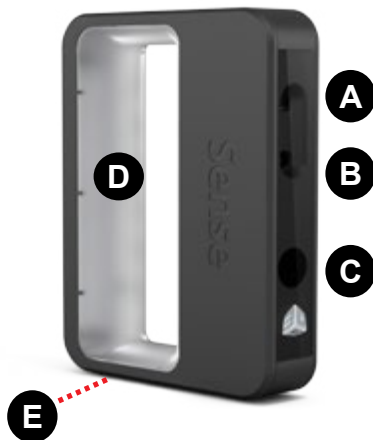
- Maximum Power Consumption: 2.25 Watts

OPERATING ENVIRONMENT

- Room Temperature: 10 – 40° C

5"
(12.9 cm)

7"
(17.8 cm)

1"
(3.3 cm)

5   AT A GLANCE

A   Depth Image CMOS

B   Color Image CMOS

C   Infrared Laser Projector

D   Comfort-Grip Handle

E   Tripod Connector

USB Connector (not shown)

6 WHATS INCLUDED
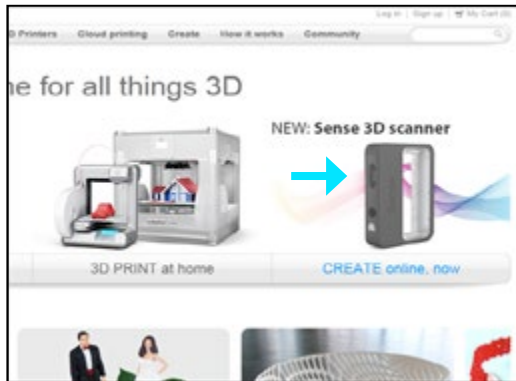

The Sense 3D Scanner

Quick Start Guide

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7 UNPACKING YOUR SCANNER

- Remove your scanner and the quick reference guide from the box.
- Connect scanner's USB cable to your computer USB port.

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8 LINK YOUR SCANNER TO YOUR CUBIFY ACCOUNT

- Creating an account on **Cubify.com** is easy and gives you access to all of the great designs and collections that will drive and inspire your creativity. Click on "**Sign up**" and join Cubify today to discover, create and share all things 3D. If you have an existing account, log on to **Cubify.com** to register your scanner and to download your Sense Software.

- Let's activate your scanner by clicking on the **Sense 3D scanner** and selecting the **Activate** tab .

- Enter your serial number; you will find it on the bottom of your scanner. Click **Activate**, a **4-digit activation pin code** will display and also, sent to you in an email. Make sure the email doesn't get caught in your spam filter! Jot down your pin number; it will be used to activate your Sense 3D Scanner. Your scanner is now registered to your account in Cubify.

9   DOWNLOAD YOUR SENSE SOFTWARE

Return to the Sense 3D Scanner screen and download the Sense software to your computer.

- Click on the **Download Software for Windows** and follow the instructions in the software prompts. After software is downloaded, you can now unlock your scanner.
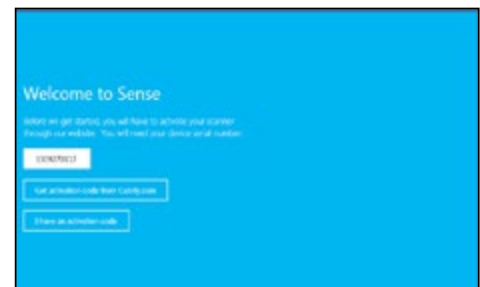

10   ACTIVATE YOUR SENSE 3D SCANNER

NOTE: If the scanner is not connected to your computer, a message will state "Device not connected."

After downloading your Sense Software, a "Sense" software shortcut was created on your desktop.

- Plug your scanner's **USB connector** into the **USB port** on your computer and click on you Sense icon to open the software.

- If you have never activated your 4-digit pin code, click on **Get activation code from Cubify.com** and retrieve your code from **"My Devices"** in your account.

- If you have your 4-digit activation pin code, click on "**I have an activation code.** You can also retrieve your pin code from your Cubify email.
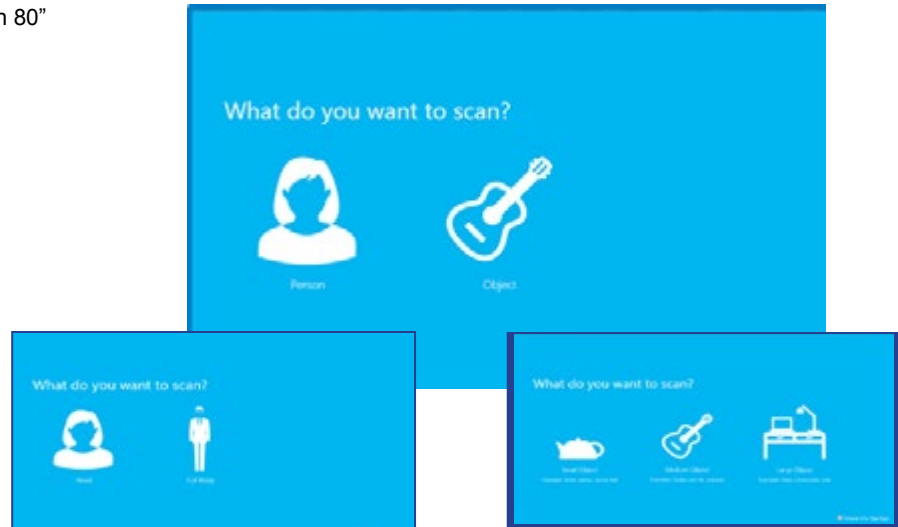
- Enter the code and click on "**Activate scanner**."

Choose what you would like to scan. If scanning a person, you have a choice of scanning the person's head or their full body. Click Person and select your choice.
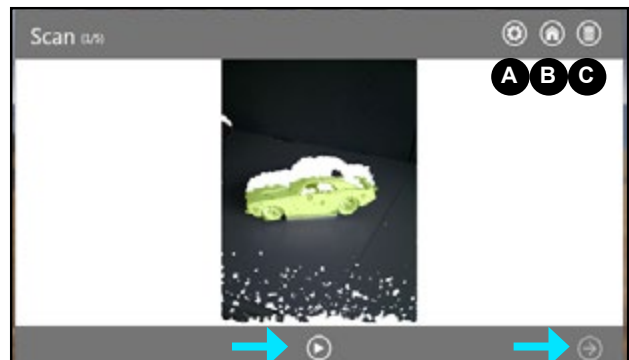**If you want to scan an object, click on the Object and choose the appropriate size for your object to begin your scan.**

- Small objects: less than 16"
- Medium object: less than 40"
- Large objects: less than 80"

Scan Tool Bar: The tool bar located at the top of the screen provides options to set your **Settings** (**A**) for the current scan, **Home** (**B**) lets you return the view to the initial position or **Start Over** (**C**), delete the scan so that you can start the it over.

3. Click on **Start Scan,** a countdown of approximately 3 seconds will begin to allow you to get in place to start your scan.

4. Hold the scanner approximately 15" away from your subject and ensure that the image is placed center on your software screen.

5. Slowly and steadily, move the scanner around the subject while viewing the image on the screen. Keep in mind, the image must be center on the software screen. If you would like to pause the scan, click on the **Scan/Pause** button. Click again, to resume the scan. Once you are satisfied, click **Next** to process your scan.

Scan Settings

- **Orientation-** toggle between landscape and portrait scan view orientation.

- **Resolution**- determines the density of the scan data acquired; higher resolution will yield denser scans but can slow down the capture speed.

- **Object Size**- determines the size of the scan volume; you can set this according to the size of the object you are scanning.

  - Prompt on Startup: you can toggle the object selection screen on or off at start up.

- **Color-** Toggle the acquisition of color from the scanner; when this is off, scanning speed is higher,

- **Frame Rate**- toggles the on-screen display of frames per second; useful for gauging your computer's capability.

- **Target Range**- toggles the display of the cross-hairs on your screen; it can be useful for keeping the scanner pointed at the center of the object being scanned.

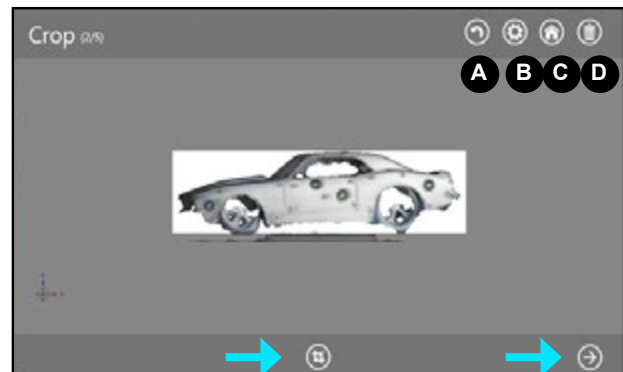 - **Range Indicator**- Provides visual guidance if you get to close or too fat to the object being scanned.

Edit Tools

Crop Tool Bar: The tool bar located at the top of the screen provides options when editing your current scan. **Undo** (**A**) erases the last change done on the scan; **Settings** (B) shows the settings for the current work flow; **Home** (**C**) lets you return the view to the initial position or **Start Over** (**D**), delete the scan so that you can start over.
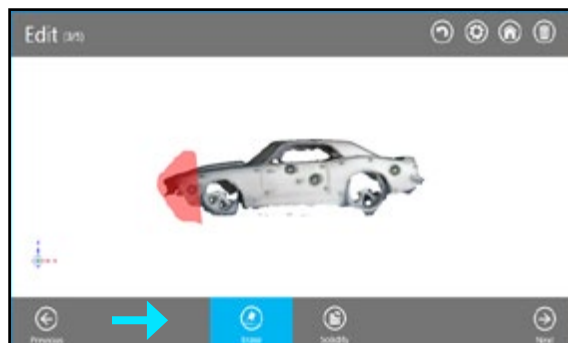
Crop Tool

- Once the scan is completed, clicking **Next** will take you to the **Crop** screen. If you need to crop your scan, use the cursor to drag a window around the part of the scan that you wish to keep. When you are finished, click on the **Crop** button to remove the part of the scan that you wanted to delete. If an error occurred while cropping, simply click **Undo** (arrow button) and your scan will return to its original state. Click **Next** to go to the **Edit** screen.
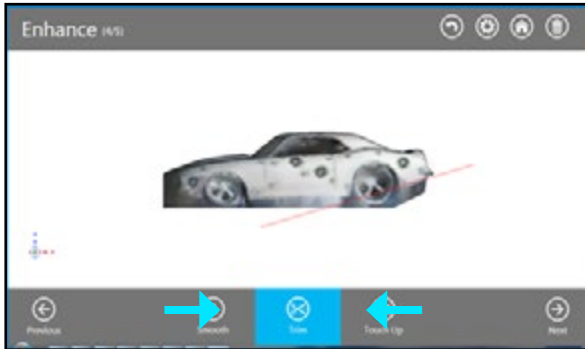
Erase / Solidify Tools

- Use the **Erase** tool to remove unwanted portions of your scan. Move the cursor over the area that you want to erase and let go of your mouse button; the unwanted portion will be removed.

- The **Solidify** tool will make your scan print-ready as a closed, watertight model.
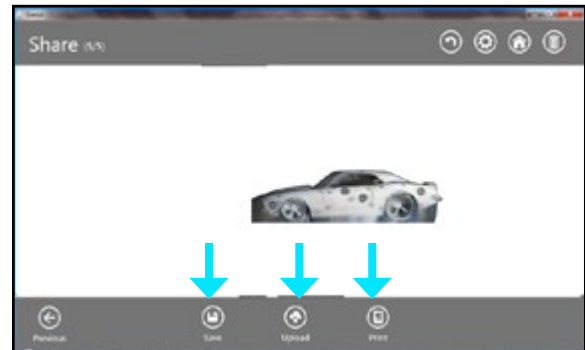
Enhance Tools

- To soften jagged edges on your scan, click on the **Smooth** tool.

- To remove unwanted areas, click on the **Trim** tool and drag the cursor over the area you want to trim away; the area will disappear.

- To improve the look of the scan, click on the **Touch Up** tool and drag the cursor over the area you wish to improve; the selected area will magically improve its appearance. The tool always removes the smaller of the two pieces and deletes the smaller mass.

Share Tool

Click on **Save** to save your scan to your computer; you can save it as a stl., ply or an obj. These file formats will work on any 3D modeling printer. If you have a 3D printer available on your network, you can choose your printer and open your saved file in the printer's client software.

- **Upload** your scan to **Share** and **Cloud Print** on Cubify. com.

- If you have the Cube Software installed, the software will open automatically showing your scan on the Cube's automated print pad allowing you to print directly to your Cube.

Edit Setting

- **Maximize Resolution-** increases the resolution of your scan before proceeding to the Edit step.

- **Resolution-** toggles display of the color on the scan.

- **Boundaries-** toggles highlighting the boundaries on the display.

- **Edges-** toggles display the edges of each triangle in your scan.

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