Digitizer™

DESKTOP 3D SCANNER

USER MANUAL

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V.2

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Welcome to the Leading Edge of the Next Industrial Revolution!

Let's Get Started.

Hi there,

When we started MakerBot in 2009, one of the biggest hurdles to 3D printing was finding great 3D models. Now you hold one of the keys to crossing this hurdle, the MakerBot Digitizer Desktop 3D Scanner.

The engineers here at MakerBot had a big task: build a machine that scans physical objects quickly and always delivers clean 3D models with no holes or extra pieces floating around. We also knew the entire process had to be seamless and simple, so that creative people could just keep creating.

After some calibration, the scan process requires just two clicks, and you'll have a complete, watertight 3D model in as little as 12 minutes. Not everything will scan perfectly; we still have to abide by the laws of physics. Read through this manual and check **makerbot.com/digitizer** so that you understand how the technology works and how to get good results.

People who own MakerBot Desktop 3D Printers tend to see the world with MakerBot goggles. We're always thinking of what we can create next. With the MakerBot Digitizer Desktop 3D Scanner, you will start to see all the things around you as the inspiration for something new. We at MakerBot can't wait to see what you create next.

Let's remake our world together.

Bre Pettis
CEO, MAKERBOT

Now, before we get going, let's review some important safety information.

FCC DECLARATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

· Reorient or relocate the receiving antenna.
· Increase the separation between the equipment and the receiver.
· Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
· Consult the dealer or an experienced radio/TV technician for help.

You may also find helpful the following booklet, prepared by the FCC: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402.

Changes and Modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commissions rules.

MANUFACTURER

MakerBot Industries, LLC
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Brooklyn, NY 11201
347.334.6800

This **safety alert symbol** precedes each safety message in this manual. This symbol indicates a potential safety hazard that could harm you or others or cause product or property damage.

Important safety information is contained in this manual. Please read the following messages thoroughly before using the MakerBot Digitizer™ Desktop 3D Scanner.

Warning: If the MakerBot Digitizer gets wet, immediately disconnect it from power and allow it to dry completely before attempting to use it again.

Caution: Handle the MakerBot Digitizer with care; it includes sensitive electronic and optical components that may be damaged if it is bumped or dropped.

Caution: Avoid excessive humidity or temperatures. When the MakerBot Digitizer is in use, avoid temperatures above 32º C or below 0º C. Do not store the MakerBot Digitizer in areas where temperatures exceed 32º C or fall below 0º C.

To use the MakerBot Digitizer safely, adhere to the following guidelines:
- Do not touch the camera filter or camera lens; oil or smudges may decrease the MakerBot Digitizer's performance.
- Do not touch the laser housing while the MakerBot Digitizer is powered on.
- Do not operate the MakerBot Digitizer if any part of the machine is cracked or otherwise damaged.
- Only use the provided power supply with the MakerBot Digitizer.
- Do not use power or USB cables if damaged.
- Do not force USB or Power connector into place.
- The socket-outlet must be installed near the equipment and must be easily accessible.

SAFETY AND COMPLIANCE

Laser Safety

**CLASS 1 LASER PRODUCT
CLASSIFIED 60825-1 2007**

The MakerBot Digitizer Desktop 3D Scanner uses two (2) Class 1 lasers when it is scanning. The Digitizer is reported certified as a Class 1 laser product under the requirements of 21 CFR (J) 1040.10 and IEC 60825-1 as per Laser Notice 50. Class 1 lasers are safe under all conditions of normal use. This means the maximum permissible exposure (MPE) is not exceeded when viewing a laser with the naked eye or with the aid of typical magnifying optics.

Laser Parameters

Wavelength	650nm, nominal
Total Laser Power (per laser)	<3.5mW
Number of Lasers	2
Laser Power for Classification	<300μ W
Mode of Operation	CW (continuous wave)
Beam Diameter	<5mm
Divergence	1 Radian x <5mRadian

⚠ **Warning:** The laser is never to be operated if the unit is defective or the cover, seal or output lens is damaged.

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Complies with US FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007. Class 1 Laser Product Classified EN/IEC 60825-1 2007

12V = 2.08A I.T.E. N136

MakerBot® Digitizer™
DESKTOP 3D SCANNER
Serial No.
⊗ MADE IN BROOKLYN, USA ⊗
MakerBot Industries, LLC | www.makerbot.com | Contains Foreign Content

UNDERSIDE OF THE MAKERBOT DIGITIZER

Service

⚠ **Caution:** Do not open the MakerBot Digitizer's laser modules or attempt to repair them. Service on your MakerBot Digitizer's lasers may only be performed by authorized, factory trained technicians. To report a problem with your MakerBot Digitizer or to arrange for service, email support@makerbot.com

All maintenance tasks for the MakerBot Digitizer must be performed with the power turned off.

DÉCLARATION DE CONFORMITÉ FCC

Cet appareil a été contrôlé et déclaré conforme aux limites relatives aux appareils numériques de catégorie B, conformément à la section 15 des directives FCC. Ces limites sont conçues pour assurer une protection raisonnable contre les interférences nuisibles dans une installation résidentielle. Cet appareil produit, utilise et peut émettre de l'énergie radio-électrique et, s'il n'est pas installé et utiisé conformément aux instructions, peut causer des interférences nuisibles aux communications radio. Cependant, il n'est pas garanti qu'il n'y aura aucune interférence pour une installation donnée. Si cet appareil cause des interférences nuisibles à la reception des signaux de radio ou de télévision, ce qui peut se déterminer en éteignant et en rallumant l'appareil, il est conseillé à l'utilisateur d'essayer de corriger les interférences à l'aide d'une ou plusieurs des mesures suivantes:

· Réorienter ou repositionner l'antenne de réception.
· Augmenter la distance existant entre l'appareil et le récepteur.
· Connecter l'appareil à une prise d'un circuit électrique différent de celui auquel le récepteur est connecté.
· Contacter le revendeur ou un technicien radio/TV qualifié pour toute assistance.

Vous pouvez également trouver utile le fascicule suivant, préparé par la FCC : « Comment identifier et résoudre les problèmes d'interférence Radio-TV ». Ce fascicule est disponible auprès de l'imprimerie nationale des Etats-Unis, Washington D.C. 20402.

Les changements et modifications apportés à cet appareil sans l'autorisation expresse du fabricant ou du déclarant peuvent annuler votre autorisation à utiliser cet appareil aux termes du règlement des la Commission Fédérale des Communications.

MANUFACTURER

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Ce **symbole d'avertissement de sécurité** précède tout message de sécurité de ce manuel. Ce symbole indique un risque potentiel pour la sécurité, qui pourrait vous blesser, blesser un tiers, ou causer des avaries ou des dommages matériels.

Ce manuel contient des renseignements importants sur la sécurité. Veuillez lire attentivement les messages suivants avant de faire fonctionner le MakerBot Digitizer.

Avertissement: Si le MakerBot Digitizer vient à se mouiller, déconnectez-le immédiatement du courant électrique et laissez-le sécher complètement avant d'essayer de l'utiliser de nouveau.

Attention: Manipulez le MakerBot Digitizer avec soin; il contient en effet des composants électroniques et optiques sensibles qui pourraient être endommagés par une manipulation brutale.

Attention: Evitez une humidité ou des températures excessives. Lorsque le MakerBot Digitizer est en cours de fonctionnement, évitez les températures supérieures à 32º C ou inférieures à 0º C. N'entreposez pas le scanner dans des endroits où les températures dépassent 32º C ou tombent en-dessous de 0º C.

Pour utiliser le MakerBot Digitizer en toute sécurité, respectez les lignes directrices suivantes:
- Ne touchez pas le filtre passe-bande; de la graisse ou des taches peuvent diminuer les performances du scanner.
- Ne touchez pas le boîtier du laser pendant que le scanner est sous tension.
- Ne faites pas fonctionner le scanner si une pièce quelconque de l'appareil est fendue ou endommagée de quelque façon que ce soit.
- Utilisez exclusivement l'unité d'alimentation fournie avec le MakerBot Digitizer.
- N'utilisez pas les câbles d'alimentation ou les cables USB s'ils sont endommagés.
- Ne forcez pas sur les connecteurs d'alimentation ou USB pour les mettre en place.
- La prise de courant doit être installée près de l'équipement, et il doit être facilement accessible.

SÉCURITÉ ET RESPECT DES NORMES

Sécurité laser

PRODUIT LASER DE CLASSE 1
CLASSÉ 60825-1 2007

Le scanner de bureau 3D MakerBot Digitizer utilise deux (2) lasers de Classe 1 pour l'opération de numérisation. Les lasers de Classe 1 sont sans danger dans toutes les conditions d'utilisation normale. Cela signifie que la limite d'exposition admissible n'est pas dépassée si vous regardez un laser sans protection oculaire ou à l'aide d'un instrument optique grossissant standard.
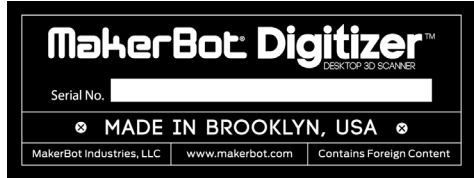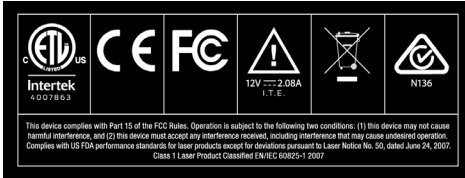
Paramètres du laser

Longueur d'onde	650 nm, nominale
Puissance totale du laser (par laser)	< 3,5 mW
Nombre de lasers	2
Puissance du laser pour Classement	< 300 µW
Mode de fonctionnement	CW (onde entretenue)
Diamètre du faisceau	< 5 mm
Divergence	1 Radian x <5mRadian

⚠️ **Avertissement:** Le laser ne doit jamais être allumé si l'unité est défectueuse ou si le couvercle, l'opercule ou la lentille de sortie sont endommagés.

⚠️ **Attention:** L'utilisation de commandes ou de réglages ou l'exécution de procédures autres que ceux spécifiés ici peut entraîner une exposition à des rayonnements dangereux.

BAS DE MAKERBOT DIGITIZER

Réparations

⚠️ **Attention:** Ne pas ouvrir les modules laser de la MakerBot Digitizer ou d'essayer de les réparer. Les services aprèsvente sur les lasers de votre MakerBot Digitizer doivent être réalisés exclusivement par des techniciens agréés formés dans nos usines. En outre, la garantie de votre scanner pourraît être annulée si vous le modifiez ou si vous en enlevez les couvercles protecteurs ou le boîtier. Pour signaler un problème avec votre scanner ou pour demander une réparation, envoyez un courrier électronique à support@makerbot.com

Toutes les tâches de maintenance pour le MakerBot Digitizer doivent être effectuées avec la puissance coupée.

ERKLÄRUNG GEMÄSS DER US-ZULASSUNGSBEHÖRDE FÜR KOMMUNIKATIONSGERÄTE FCC

Die Prüfung dieses Geräts hat ergeben, dass die Grenzwerte für ein digitales Gerät der Klasse B gemäß Teil 15 der FCC-Bestimmungen eingehalten werden. Diese Grenzwerte dienen dem angemessenen Schutz gegen Störungen und Schäden beim Gebrauch in Wohnräumen. Dieses Gerät erzeugt und verwendet Hochfrequenzenergie und strahlt diese auch aus; wenn es nicht ordnungsgemäß und in Übereinstimmung mit den Sicherheitshinweisen installiert und benützt wird, kann es Störungen bei Radio-, Funk- und Fernsehgeräten erzeugen. Es gibt jedoch keine Garantie, dass eine Störung bei bestimmten Installationen ausgeschlossen werden kann. Wenn dieses Gerät Störungen beim Empfang von Radio oder Fernsehen erzeugt, was durch Aus- und Einschalten des Geräts festgestellt werden kann, kann der Benützer diese Störung durch eine oder mehrere der folgenden Maßnahmen zu beheben versuchen:

· Richten Sie die Empfangsantenne neu aus oder versetzen Sie sie
· Vergrößern Sie den Abstand zwischen Gerät und Empfänger.
· Schließen Sie das Gerät an den Ausgang eines vom Empfangsgerät separatem Schaltkreises an.
· Kontaktieren Sie den Händler oder einen erfahrenen Radio/TV - Techniker.

Unter Umständen ist Ihnen auch das folgende, vom FCC erstellte Handbuch nützlich: "How to Identify and Resolve Radio-TV Interference Problems" (Probleme bei Radio/TV-Störungen identifizieren und beheben). Dieses Handbuch ist beim U.S. Government Printing Office, Washington D.C. 20402, erhältlich.

Veränderungen und Modifizierungen, die nicht ausdrücklich vom Hersteller oder vom Registranten dieses Gerätes genehmigt sind, können nach den Richtlinien der Federal Communications Commission Ihr Recht erlöschen lassen, dieses Gerät zu benützen.

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⚠

Dieses Warnhinweis-Symbol steht vor jedem Sicherheitshinweis in dieser Bedienungsanleitung. Dieses Symbol weist auf ein potentielles Sicherheitsrisiko hin, dass Ihnen und anderen Schaden zufügen oder Produkt- und Sachschaden verursachen könnte.

Diese Bedienungsanleitung enthält wichtige Sicherheitshinweise. Bitte lesen Sie die folgenden Hinweise aufmerksam durch, bevor Sie den MakerBotDigitizer in Betrieb nehmen.

⚠ **Warnung:** Sollte der MakerBot Digitizer mit Flüssigkeit in Berührung gelangen, trennen Sie ihn sofort von der Stromzufuhr und lassen Sie ihn vollständig trocknen, bevor Sie erneut versuchen, ihn in Betrieb zu nehmen.

⚠ **Vorsicht:** Handhaben Sie den MakerBot Digitizer sorgfältig; er beinhaltet empfindliche elektronische und optische Komponenten, die bei nachlässiger Handhabung beschädigt werden könnten.

⚠ **Vorsicht:** Vermeiden Sie extreme Temperaturen oder Feuchtigkeit. Wenn der MakerBot Digitizer benützt wird, vermeiden Sie Temperaturen über 32º C oder unter 0º C. Bewahren Sie den MakerBot Digitizer nicht an Orten mit Temperaturen über 32º C oder unter 0º C auf.

Um den MakerBot Digitizer sicher zu benützen, beachten Sie die folgenden Richtlinien:
- Berühren Sie den Bandpassfilter nicht; Öl oder Flecken können die Leistung des MakerBot Digitizers beinträchtigen.
- Berühren Sie das Lasergehäuse nicht, während der MakerBot Digitizer angeschlossen ist.
- Verwenden Sie den MakerBot Digitizer nicht, wenn ein Bestandteil des Geräts gebrochen oder auf andere Weise beschädigt ist.
- Benützen Sie ausschließlich das mitgelieferte Netzgerät für den MakerBot Digitizer.
- Verwenden Sie keine beschädigten Strom- oder USB-Kabel.
- Wenden Sie beim Anstecken der USB- oder Stromverbindung keine Gewalt an.
- Die Steckdose muss in der Nähe der Geräte installiert werden, und es muss leicht zugänglich sein.

SICHERHEIT UND EINHALTUNG DER RICHTLINIEN

Laser-Sicherheit

**LASER-PRODUKT DER KLASSE 1
KLASSIFIZIERT 60825-1 2007**

Der MakerBot Digitizer Desktop 3D Scanner verwendet zwei (2) Laser der Klasse 1 im Scan-Prozess. Laser der Klasse 1 sind unter Bedingungen des normalen Gebrauchs sicher. Das bedeutet, solange die maximal zulässige Bestrahlung (MZB) nicht überschritten wird, wenn man das bloße oder mit üblichen optischen Vergrößerungsbehelfen versehene Auge dem Strahl aussetzt.
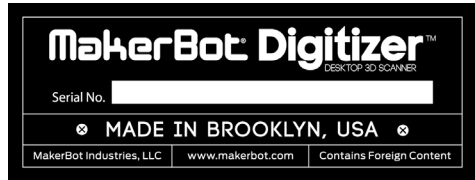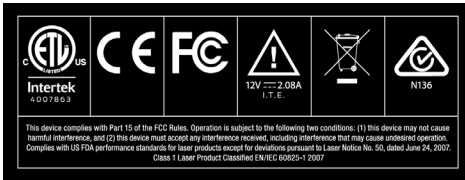
Laser-Parameter

Wellenlänge	650nm, nominal
Laser-Gesamtleistung (pro Laser)	<3.5mW
Anzahl der Laser	2
Laser-Leistung zur Klassifizierung	<300µ W
Betriebsmodus	CW (Dauerstrich)
Strahl-Durchmesser	<5mm
Divergenz	1 Radian x <5mRadian

⚠ **Warnung:** Der Laser darf unter keinen Umständen verwendet werden, wenn das Gerät defekt oder die Abdeckung, der Verschluss oder die Abschlusslinse beschädigt sind.

⚠ **Vorsicht:** Die Verwendung von Steuerelementen, Einstellungen oder die Durchführung anderer Schritte als die hier angegebenen können zu gefährlicher Strahlung führen.

BODEN MAKERBOT DIGITIZER

Service

⚠️ **Vorsicht:** Öffnen Sie den MakerBot Digitalisierer-Laser-Module nicht und versuchen Sie nicht, ihnen zu reparieren. Service an Ihrem MakerBot Digitalisierer-Laser-Module darf nur von autorisierten, im Werk ausgebildeten Technikern ausgeführt werden. Darüber hinaus kann jegliche Manipulation an Ihrem MakerBot Digitizer oder das Entfernen von Schutzabdeckungen oder des Gehäuses die Garantie erlöschen lassen Um ein Problem mit Ihrem MakerBot Digitizer zu melden oder um einen Servicetermin zu vereinbaren, schreiben Sie an support@makerbot.com

Alle Wartungsarbeiten für den MakerBot Digitizer muss durchgeführt mit das Gerät ausgeschaltet werden.

ABOUT THE MAKERBOT DIGITIZER

The MakerBot Digitizer Desktop 3D Scanner can scan a real world object and produce a ready-to-print 3D model in as little as 12 minutes, with no post-processing or cleanup required.

All MakerBot Digitizer scans are created using MakerBot's easy-to-use MakerWare for Digitizer software. MakerWare for Digitizer creates industry standard stereolithography (STL) files which can be imported into or modified with most 3D modeling software.

Before you start using the MakerBot Digitizer, let us tell you a little more about how it works and what its capabilities are.

i **Note:** For the most complete and up-to-date tips on getting the most out of your MakerBot Digitizer, go to the **Learn More** section at **makerbot.com/digitizer**
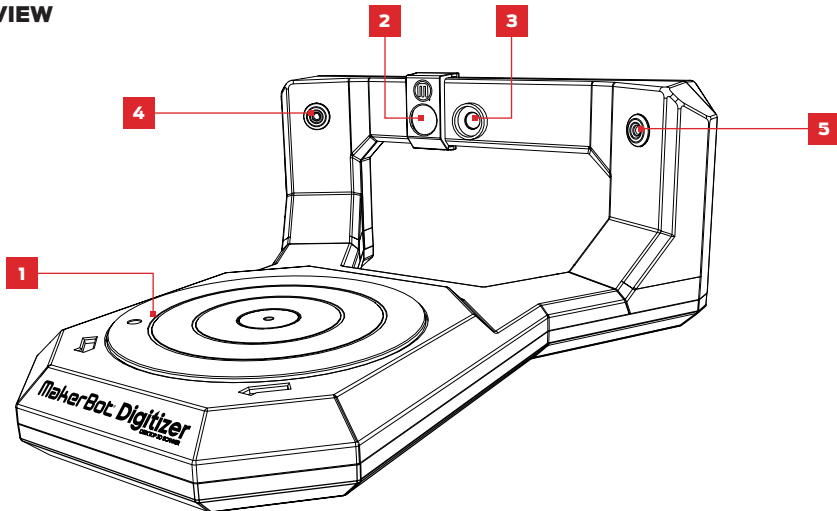
MakerBot Digitizer Diagrams

FRONT VIEW

1	Turntable
2	Camera Filter
3	Camera
4	Left Laser Aperture
5	Right Laser Aperture

BACK VIEW

6	Right Laser Adjustment Screws
7	Left Laser Adjustment Screws
8	USB Port
9	Power Input Port
10	Power Switch

FRONT VIEW

BACK VIEW
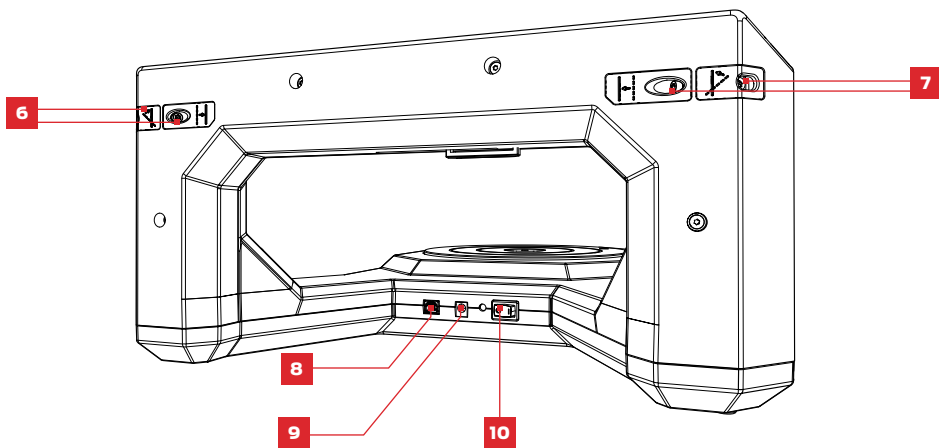
ABOUT THE MAKERBOT DIGITIZER

How it Works

The MakerBot Digitizer Desktop 3D Scanner creates a digital 3D model of a physical object by taking a rapid sequence of pictures as the object rotates on the MakerBot Digitizer turntable. Here is how it happens:

1. Two lasers, mounted on the left and right corners of the MakerBot Digitizer, create laser lines that outline the profile of the object, while a camera takes a series of photographs.

2. MakerWare for Digitizer software takes the photographs of the laser lines and combines them to create a point cloud.

3. If a completed scan still needs improvement, MakerWare for Digitizer can rescan the object from a different angle and combine the two sets of scan data using MakerBot MultiScan™ Technology.

   Your final scan will be a manifold 3D mesh that can be printed on your MakerBot, shared on Thingiverse.com, or modified in almost any 3D modeling software.

i **Note:** The MakerBot Digitizer has a dimensional accuracy of up to 2 mm.

What can be Scanned?

Some objects will produce better scans than others. Here are a few guidelines to help you determine what will produce a good scan.

GREAT TO SCAN

- Objects that are larger than a 50 x 50 mm (2 x 2 in) cylinder
- Objects that are smaller than a 203 x 203 mm (8 x 8 in) cylinder
- Objects weighing less than 3 kg (6.6 lbs)
- Stationary objects
- Opaque objects

DIFFICULT TO SCAN

- Transparent objects
- Shiny or reflective objects
- Very dark objects
- Fuzzy objects

DO NOT SCAN

- Moving objects
- Objects that weigh more than 3 kg (6.6 lbs)
- Objects that are larger than a 203 x 203 mm (8 x 8 in) cylinder
- Objects that are smaller than a 50 x 50 mm (2 x 2 in) cylinder

i **Tip:** You can reduce glare on reflective surfaces or lighten dark surfaces by applying corn starch with a paint brush. For more tips, go to the **Learn More** section at **makerbot.com/digitizer**

2

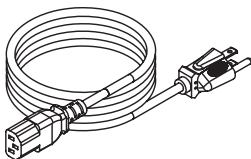# Setting Up Your MakerBot Digitizer

In this chapter you will be guided through everything you need to do to set up your new MakerBot Digitizer Desktop 3D Scanner, from unpacking it to producing your first 3D scan.

ACCESSORY CHECKLIST
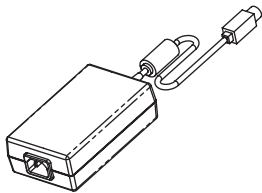
1
POWER SUPPLY

1
POWER CABLE
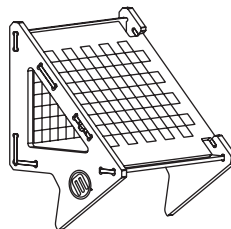
1
CALIBRATION TOOL
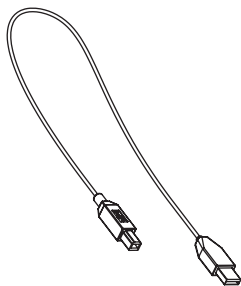
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USB-A TO USB-B CABLE
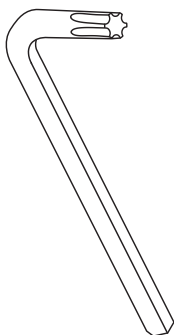
1
T15 TORX DRIVER

4
RUBBER TRACTION FEET
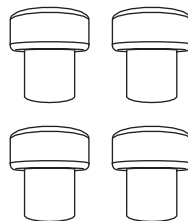
1 | Open the Box

Place the MakerBot Digitizer box on a stable surface. Cut the tape on both sides of the box as well as the tamperproof sticker located on the front secure tab.

2 | Open Accessory Box

Remove and open the accessory box. Check the contents of this box and make sure it has everything that's listed in the Accessory Checklist.

3 | Lift MakerBot Digitizer out of Box

Grasp the protective foam packaging at both sides and lift the MakerBot Digitizer out of the box.

4 | Remove Packaging

Separate both foam packaging pieces from the MakerBot Digitizer and remove the clear plastic bag.

| 5 | Attach Rubber Traction Feet |

Locate the four rubber traction feet from the accessory box. Carefully turn the MakerBot Digitizer upside down and insert one rubber traction foot into each of the four holes on the underside of the MakerBot Digitizer.

PLACEMENT OF THE MAKERBOT DIGITIZER

Finding the right location for your MakerBot Digitizer is important.
Follow these guidelines to ensure the best quality scans:

- Set up your MakerBot Digitizer in an indoor area with ample incandescent or fluorescent light. Avoid natural light sources.
- Avoid pointing the MakerBot Digitizer's camera and lasers toward light sources. Avoid placing the MakerBot Digitizer directly below a light source.
- Place your MakerBot Digitizer on a flat, stable work surface and make sure no part of the MakerBot Digitizer extends over the surface edge. If it is not in a stable position, the MakerBot Digitizer could fall, damaging itself and causing injury to the user.
- Make sure to set up your Makerbot Digitizer at least one foot away from the nearest wall.

AERIAL VIEW OF ROOM

Set up at least 1 ft away from a wall.

Light sources should be placed outside of the MakerBot Digitizer's line of sight.

MAKERBOT DIGITIZER

Avoid natural light aiming directly at camera.
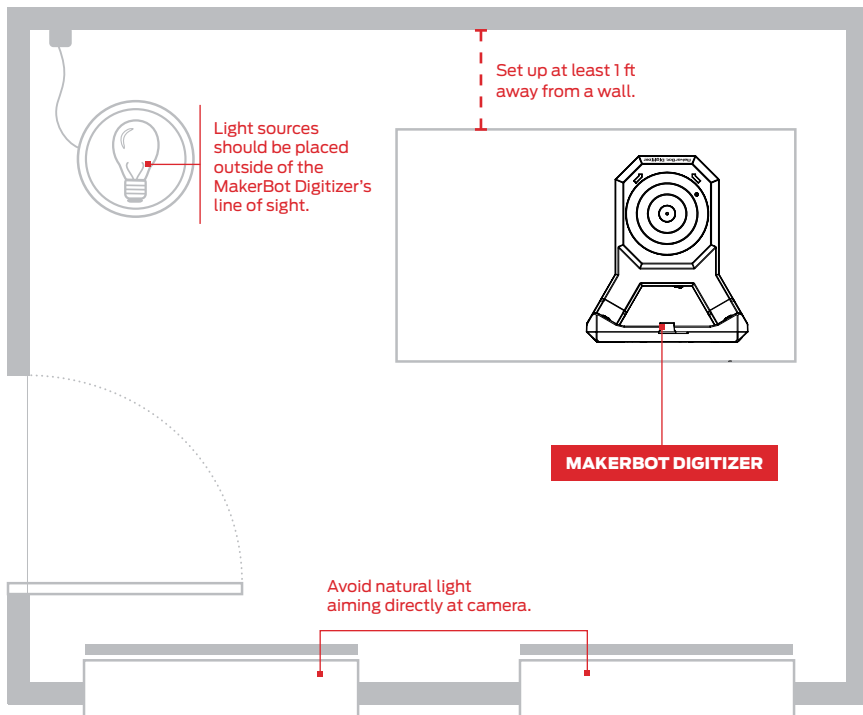
6 | **Connect the MakerBot Digitizer to a Computer**

Locate the USB cable from the accessory box and use it to connect the MakerBot Digitizer to your computer.
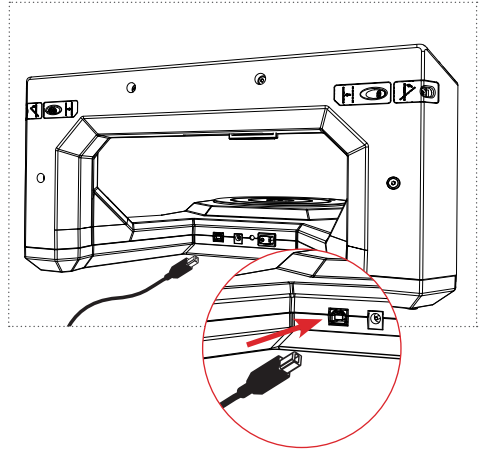
7 | **Connect the Power Supply**

Ensure that the power of the MakerBot Digitizer's power switch is set to Off.

Locate the power supply and power cable from the accessory box and attach the cable to the power supply.

Insert the power supply connector into the power input port on the back of the MakerBot Digitizer and plug the power cord into an electrical outlet.
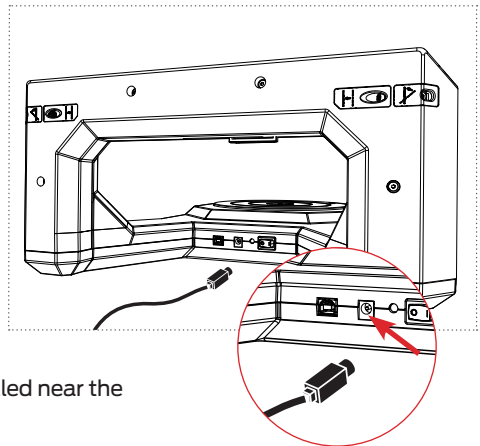
⚠ **Caution:** The socket-outlet must be installed near the equipment and must be easily accessible.

ℹ **Note:** MakerBot's distributor will provide a certified plug adapter with national pin configuration for international users.

MakerWare for Digitizer is the software that drives your MakerBot Digitizer.

The MakerWare for Digitizer package also includes the most current version of MakerWare, MakerBot's 3D printing software. If MakerWare is already installed on your computer, the software will automatically update to the most current version. When you first run MakerWare or MakerWare for Digitizer, a folder called "My Things" (on PCs), or "Things" (on Macs), is created in your home directory. This is where your MakerBot Digitizer scans will be saved by default.

1 | Download Makerware for Digitizer

- Open a browser session and go to **makerbot.com/digitizer**

- Click the MakerWare for Digitizer link. You will be taken to the MakerWare for Digitizer download page.

- Select your operating system from the dropdown menu and click the download button. The system-specific installer file will download to your computer.

2 | Run the Installer

Double-click MakerWare Bundle of Awesome to run the installation wizard and follow the installation instructions.
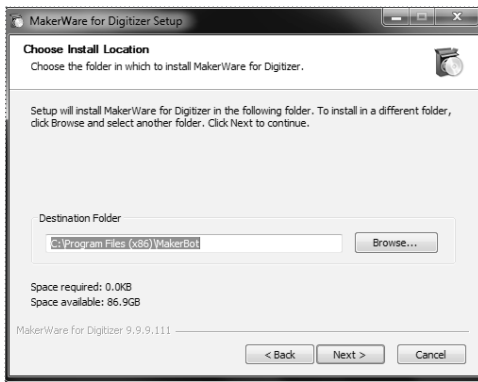
You are almost ready to begin your first scan, but first you have to to calibrate your new MakerBot Digitizer. The calibration routine ensures that the position of the turntable and lasers are recorded accurately so your MakerBot Digitizer can produce the best scan possible.

Recalibrate the turntable and lasers about once a week—or every 20 scans—to make sure that scan quality remains constant. If you move, bump or drop your MakerBot Digitizer, the positions of the lasers and turntable might change slightly. In any of those cases, you might need to recalibrate the lasers and turntable. To run the calibration routine at any time, go to the *Scanner* menu and choose *Calibrate Turntable & Lasers*.

> **i** **Note:** It is not possible to exit the calibration routine once it has started.

1   Open MakerWare for Digitzer

Ensure that the MakerBot Digitizer is powered on and connected to your computer. A message will appear indicating that your MakerBot Digitizer is new and needs to be set up. Click **Get Started** to proceed.
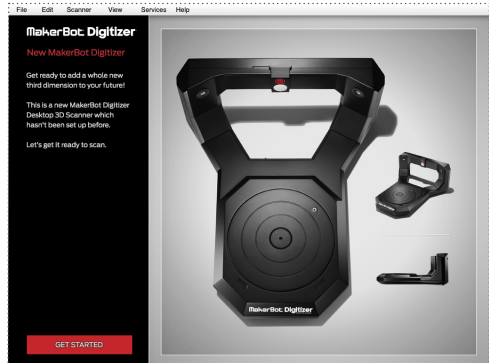
2   Check Your Location + Lighting

MakerWare for Digitizer will explain how to make sure your MakerBot Digitizer is ready to produce a great scan. Follow all three steps before clicking **Continue**.

3 | Calibrate the MakerBot Digitizer Camera

Locate the calibration tool from the accessory box and place it on the turntable with the letter **A** pointing up, as shown on the screen. Insert the tab on the lower edge of the calibration tool into the hole at the center of the turntable. Ensure that the calibration tool is positioned as shown before clicking **Continue**.
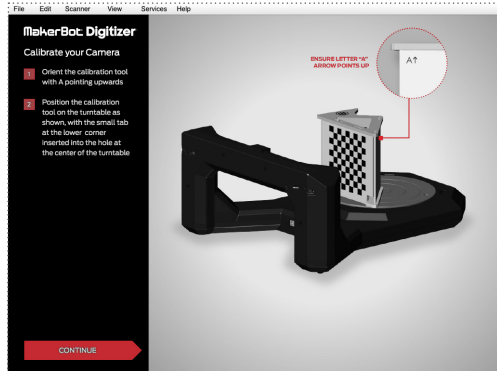
4 | Calibrate the MakerBot Digitizer Turntable

Flip the calibration tool so that the letter **B** points up as shown on the screen, and insert the tab on the lower edge of the calibration tool into the hole at the center of the turntable. Ensure that the calibration tool is positioned as shown before clicking **Continue**.
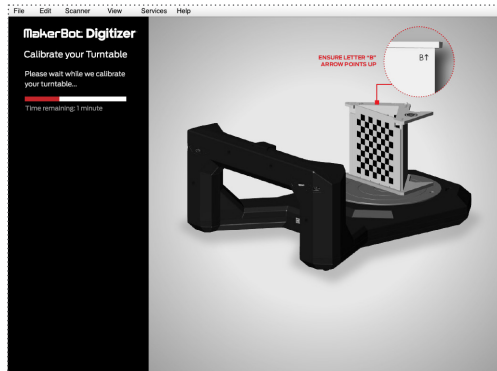
5 | Calibrate the MakerBot Digitizer Lasers

Slide the front panel out of the calibration tool and place it on the turntable with the letter **C** pointing up, as shown on the screen. Ensure that the calibration tool is positioned as shown before clicking **Continue**.
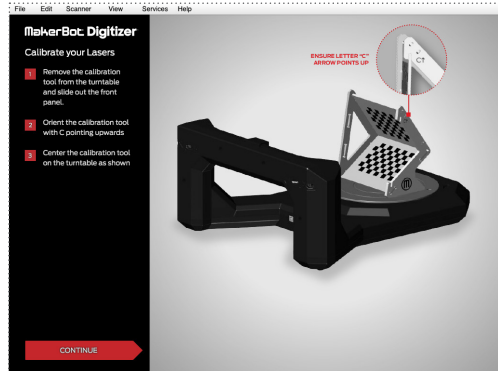
6 | Calibration Complete

Before you start scanning, let's name your MakerBot Digitizer and set your sharing options. Click **Continue** again to begin. You can change your preferences at any point by choosing *Settings* from the *File* menu. On a Mac, the same options are available as *Preferences* in the *MakerWare for Digitizer* menu.

SET BASIC PREFERENCES

1 | Set Up Your MakerBot Digitizer

NAME YOUR MAKERBOT DIGITIZER
By default the name of your MakerBot Digitizer is "My MakerBot Digitizer". To create a unique name for your MakerBot Digitizer, click within the **Name your MakerBot Digitizer** text field and type the new name.

HELP IMPROVE MAKERBOT DIGITIZER
Help us help you. By checking the "Share my usage statistics to help improve MakerBot Digitizer" checkbox, you're allowing us to view information that will help us continue to make the MakerBot Digitizer better.

2 | Connect to Makerbot Thingiverse

Thingiverse.com is MakerBot's online community for sharing and downloading 3D models and other designs. Use MakerBot Thingiverse to share and store the 3D models you create with your MakerBot Digitizer.

TO AUTOMATICALLY SYNC YOUR SCANS WITH YOUR
MAKERBOT THINGIVERSE ACCOUNT
Check **Private Sync** before signing in. If you check this box, MakerWare for Digitizer will automatically add your scans to your Thingiverse account as unpublished Things. If you leave this box unchecked, nothing will be sent to Thingiverse automatically.

TO CREATE A MAKERBOT THINGIVERSE ACCOUNT
Click the **Sign up on Thingiverse** link.

TO CONTINUE WITHOUT LOGGING IN
Click **Skip this Step**. You can log into Thingiverse at any time by choosing *File > Settings* on a PC or *MakerWare for Digitizer > Preferences* on a Mac, or by choosing **Share on Thingiverse** at the end of a scan.

| 3 | **Start Scanning** |

The setup process is complete. Proceed to the next chapter to start scanning with your MakerBot Digitizer.

3

Scanning with Your MakerBot Digitizer

Once you're finished calibrating your MakerBot Digitizer and setting your sharing preferences, you will be taken to the New Scan screen. This is your MakerWare for Digitizer home screen.

Before you start scanning with your MakerBot Digitizer, let's go over some basics and best practices.

i **Note:** You can return to New Scan screen at any time by choosing *New* from the *File* Menu.

SCANNING 101

A single scan takes approximately 12 minutes total. During each scan, the object revolves on the turntable twice. The right laser scans the object during the first revolution and the left laser scans the object during the second revolution. Each revolution takes about five minutes. Then the information from the right and left scans are combined to create a detailed point cloud. After the scanning stage, MakerWare for Digitizer will convert the point cloud it has created into a continuous mesh. This process should take approximately two minutes.

Additional scans added with MultiScan Technology will take about the same amount of time: 10 minutes to gather new scan data and a few minutes to combine it with the original point cloud and create a new continuous mesh.

Object Placement

The first step of the scanning process is placing your object on the turntable. The guiding principle of object placement is that as much of the object as possible should be in the line of sight of both the camera and lasers during as much of the scan as possible. To choose how to place your object, first check to see if any part of your object will obscure the camera's view of any other part of your object. For example, the sides of a bowl could prevent the camera from seeing the inside of the bowl, or the arm of a statue could get in the way of the camera's view of the body of the statue.

When scanning an object without any of these kinds of overlaps, place the object so that as much of it as possible is at the center of the turntable. For example, a long, thin object might be placed upright at the center of the turntable.
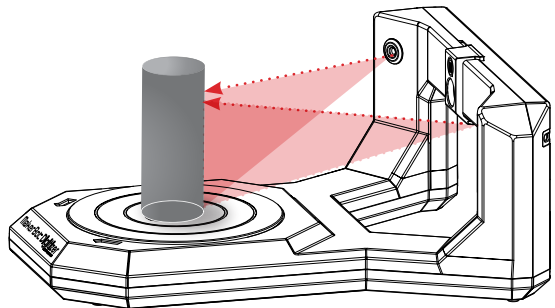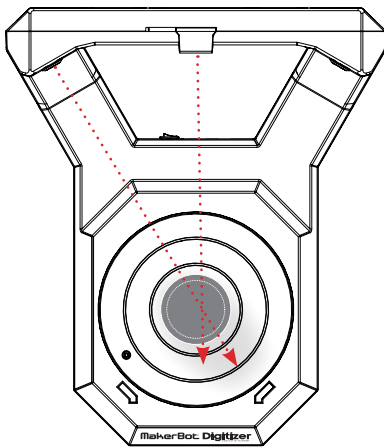
If your object does have features that overlap other parts of it, place the object so that the hardest part to see is as visible as possible to both the lasers and the camera. For example, a bowl might be placed on its side with the inside facing the center of the turntable.

i **Tip:** If your object doesn't stay in place by itself, try resting the object on a piece of modeling clay. For more tips, go to the **Learn More** section at **makerbot.com/digitizer**
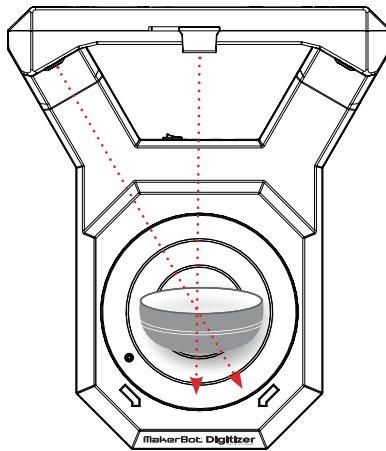
Note that there may be exceptions to these rules. It's not always possible to predict what position will produce the best scan, so if you're having trouble getting a good scan of an object, try placing it at a different angle.

If you are planning on combining multiple scans with MultiScan Technology, scan your object in its tallest position first. That way you will be able to crop unwanted data without risking cutting off pieces of additional scans.

SCANNING 101

Scan Presets

To get the best scan possible, choose the scan preset that best matches the object you want to scan. Scan presets are based on an object's shade value, and each preset covers a range of shades.

An object's shade value is described as "light," "medium" or "dark" based on how close it is to white. For instance, flat white is lighter than canary yellow and bright red is lighter than navy blue. Choosing the right scan preset is not an exact science and is based on your judgment of where the object fits within the shade spectrum.

The preset for dark objects can also work well with other surfaces that are difficult to scan. If object you are scanning is fuzzy or shiny, try using the Dark/Difficult to Scan preset even if it is light in color.

Choose **Light** to scan a white or light-colored object.

Choose **Medium** to scan a brightly colored object or an object that is neither light nor dark.

Choose **Dark/Difficult to Scan** to scan dark, reflective or fuzzy objects. Keep in mind that these objects might not scan well using any settings.

i **Note:** A fuzzy object is an object with a surface covered in small hairs or fibers. Examples include stuffed animals, velvet-like fabrics and felt.

LIGHT
Choose this for lighter colored objects.

MEDIUM
Choose this for objects which are neither light nor dark.

DARK/ DIFFICULT TO SCAN
Choose this for moderately dark objects. Note that extremely dark objects may still cause problems.

i **Note:** We love gnomes! If you have any, please digitize them and upload them to Thingiverse with the tag #GnomeScan.

MultiScan™ Technology

Sometimes one scan isn't enough to capture all of an object's important features. For those times, there's MakerBot MultiScan™ Technology, which allows you to combine multiple scans of the same object.

Here's how it works:

1. First scan your object. Scan it in its tallest position first, so that any unwanted data you crop won't cut off pieces of later scans.

2. When the scan is complete, crop out any unwanted data at the top or bottom of your scan. Scans added with MultiScan Technology will only scan within the cropped area.

3. Click and drag in the viewport to examine your raw scan data and figure out which areas need more or better data. Rotate your object on the turntable to expose those areas to the camera.

4. Click **Start MultiScan** to begin a new scan. MakerWare for Digitizer will gather the new set of scan data, combine it with the scan data you already have, and create a new mesh. You can add as many additional scans as you need, but two or three are usually enough, and additional scans could reduce surface quality.
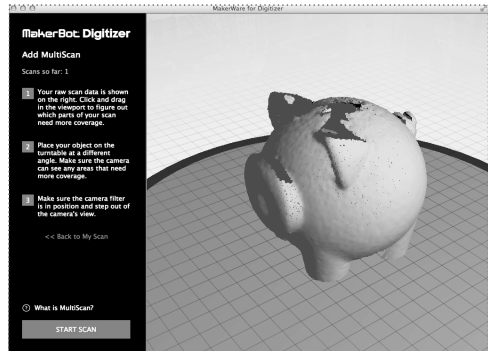
Crop

MakerWare for Digitizer will make sure your scan is completely watertight, but a difficult to scan object or a bad lighting situation can create unwanted artifacts in your 3D mesh. For those situations, or for occasions when you need to give your scan a flat top or bottom, MakerWare for Digitizer includes a crop function.

To crop your scan:

1. When you arrive at the Scan Complete screen, click **Crop Scan Area.**

2. Drag the arrows at the right to move the top and bottom cutting planes. Position the planes so that anything you want to cut off the bottom of your scan is below the bottom cutting plane and everything you want to cut off at the top of your scan is above the top cutting plane.

3. Click **Preview Crop** to see what your cropped scan will look like. If you are not happy with the crop, click **Undo Crop** to restore both cutting planes to their original positions. You can also click the **X** on a cutting plane's arrow to restore only that plane to its original position.

4. When you are happy with your results, click Done Cropping to crop your scan. You can return to the Crop screen from the Scan Complete screen by clicking **Edit Crop**. You will not be able to return to the Crop screen after saving your scan or starting MultiScan.
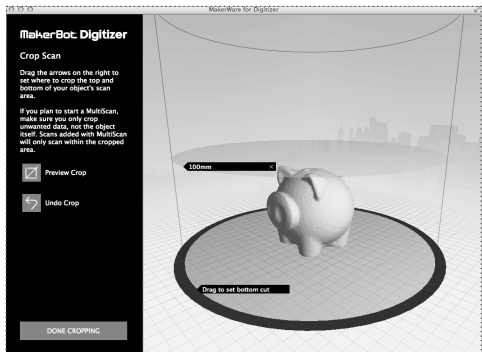
Scanning Tips

During a scan, the MakerBot Digitizer Desktop 3D Scanner shines laser beams on your object. The camera captures images of the laser lines and MakerWare for Digitizer translates those images into a point cloud. Objects that are either too reflective or not reflective enough will result in images that are difficult for the software to interpret. That is why it can be difficult to produce a high-quality scan of an object that is shiny, transparent, fuzzy, or very dark.

To scan objects that fit this description, try one or more of the following:

- Dust reflective or transparent objects with a fine white powder such as corn starch or baby powder to reduce reflections.
- Paint an object to reduce shininess, smooth a fuzzy texture, remove transparency, or turn a very dark object white.
- Cover fuzzy, mirrored, or transparent sections of an object with masking tape.

i **Note:** For additional tips and tricks, go to the **Learn More** section at **makerbot.com/digitizer**

To begin a new scan, MakerWare for Digitizer must be in the New Scan state. You will be taken to the New Scan screen at the end of the initial calibration and setup routine. You can also access the New Scan screen at any time by choosing *New Scan* from the *Scanner* menu.

TO SCAN AN OBJECT

1 | Position Filter on Camera Lens

Ensure that the camera filter is positioned over the camera lens. Avoid touching the camera filter or camera lens.
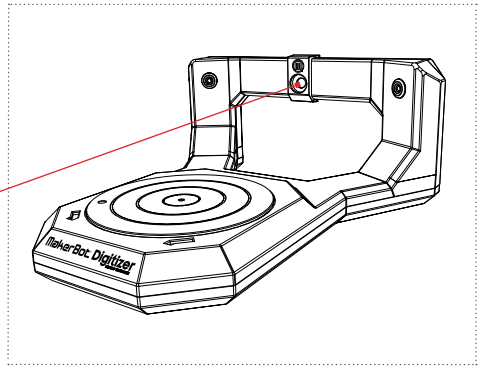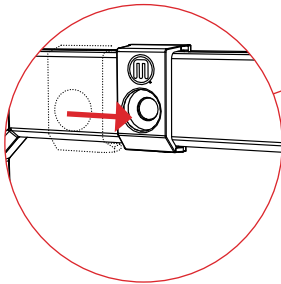
2 | Place Object on Platform

See page 38 for guidelines on object placement. Note that parts of an object that extend outside of the scan cylinder will be excluded from the scan and may affect overall scan quality.
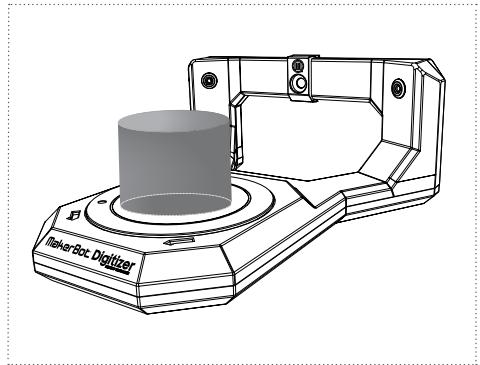
3 | Select a Scan Preset

See page 40 for information on choosing a scan preset.
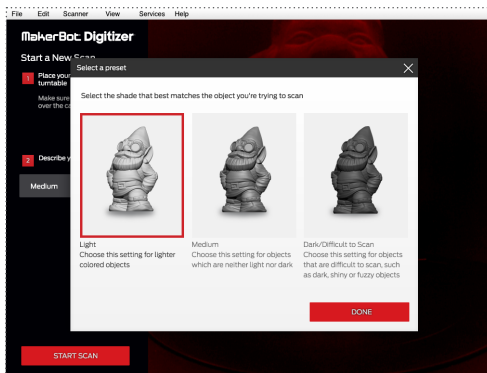
4 | Check the camera view

If you can see yourself in the camera view, step out of the camera's line of sight. Before starting to gather scan data, the Digitizer will capture an image of your object and its background and use it to filter the background out of the scan images.

5 | Click Start Scan

During the scan, data points will appear in the viewport as the MakerBot Digitizer identifies points on the surface of your object. A progress bar will also appear, showing the estimated time remaining in the scan. During the scan, you can use your mouse to view the partial point cloud from different angles.

i **Note:** Do not touch or move the object being scanned while the scan is in progress.
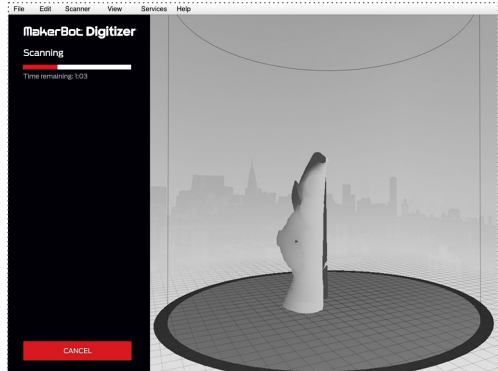
- **To rotate:** left-click and drag within the viewport
- **To pan:** middle-click and drag within the viewport OR shift key + left-click and drag within the viewport
- **To zoom:** scrollwheel

After the MakerBot Digitizer finishes scanning your object, MakerWare for Digitizer will automatically turn the generated point cloud into a manifold 3D mesh. A manifold 3D mesh is completely enclosed and has no holes, reversed faces or extra geometry.

The meshing process should take approximately two minutes. When the mesh is complete, it will appear in the viewport.

i **Note:** Did you get a mesh that doesn't look like your object? If some parts of your object look much better than others, try adding an additional scan using MultiScan Technology. If the whole scan looks wrong, and you've double-checked your lighting, object placement and calibration, it's possible that you just have an object that doesn't scan well. We're working on making sure there are fewer of those, and you can help by sending us some information about your failed scan. See page 58 in the Troubleshooting section for more details.

Once your scan is complete, you can name your file and crop any unwanted data from the top and bottom of your mesh and add additional scans before you save a final 3D model file.

NAME YOUR SCAN

Enter a name for your scan file in the **Name your Scan** field. Your file will be saved to your Things (on a Mac computer) or My Things (on a Windows computer) folder as a Thing file. If you do not enter a name into the **Name your Scan** field, the Thing file will be saved as "My Scan at [datestamp]."
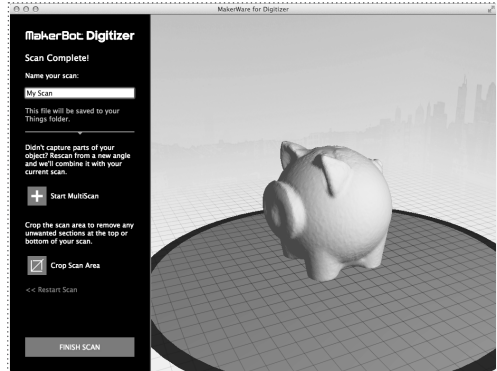
MULTISCAN

Click **Start MultiScan** to add additional scan data. MakerWare for Digitizer will walk you through adding as many scans as you need to capture every part of your object. See page 42 for instructions on using MultiScan Technology.

CROP

Click **Crop** to go to the crop screen, where you can cut off the top or bottom of your object or remove unwanted data above or below your object. See page 43 for instructions on using the Crop feature.

SAVE + CONTINUE

Click **Continue** to save the scan to your Things or My Things folder and continue to the next screen.

Share your Scan

Now that your scan is complete, why not share it on MakerBot Thingiverse? When you save your scan, you will be prompted to take a photo and share it. You will be guided through the sharing process each time you finish a scan.

1. TAKE A PHOTO
During the **Take a Photo** step, the camera view of your MakerBot Digitizer will appear at the right. To take a picture:

- Center your object on the turntable so that it appears in the camera view.
- Slide the camera filter off of the camera.
- Click the **Take a Photo** button.

Remember to slide the camera filter back over the camera lens when you are done.

If you do not want to be guided through sharing your scans to MakerBot Thingiverse in the future, select the **Don't show again** checkbox. If you want to share your scan, but don't want to take a photo, click **Skip this step**.

2. UPLOAD TO MAKERBOT THINGIVERSE
Once you have taken a photo, you can enter information about your scan before uploading it to MakerBot Thingiverse. If you are not logged into MakerBot Thingiverse, MakerWare for Digitizer will prompt you to sign in and then return you to the sharing step.

Enter the following information:
Thing name:
Type the name of your scan as you want it displayed on MakerBot Thingiverse. The name you type here will be used as the title of the Thing and will not change the name of your scan file.

Description:
Type the description you wish to display with your scan on MakerBot Thingiverse.

Category:
Select the category of Things where you want your scan published from the dropdown menu. The category is set to *Art > Scans & Replicas* by default.

Share your Scan (Continued)

License:
Select the type of license that you want your scan published under from the dropdown menu. The license is set to **CC - Attribution - Non - Commercial** by default. For descriptions of the available Creative Commons licenses, see **creativecommons.org/licenses**

If you do not want to be guided through sharing your scans to MakerBot Thingiverse in the future, select the **Don't show again** checkbox. If you want to skip the sharing process completely, click **Skip this step**.

Click the **Share on Thingiverse** button to upload your scan.

3. DONE!
When your scan is uploaded to MakerBot Thingiverse, MakerWare for Digitizer will display a link to the published scan. You will also have the option to share your published scan to social media.

Next Steps

SHARE ON THINGIVERSE

If you skipped the **Share on Thingiverse** prompt after you saved your scan, you can still publish to MakerBot Thingiverse. Click this button or choose *Share* from the *File* menu to open the Share on Thingiverse dialog at any time.

i Note: You must be logged in to MakerBot Thingiverse to share.

PRINT WITH MAKERWARE

MakerBot MakerWare is the software that drives MakerBot 3D printers. When you click **Print with MakerWare,** the most recent scan is opened in MakerWare. You can also open the most recently saved scan in MakerWare at any time by choosing *Open in MakerWare* from the *File* menu.

EXPORT THIS SCAN

This allows you to save another copy of the scan with a different name or file format, or to a specific location. This new version will not replace the original file that was saved to your Things or My Things folder. You can also save the most recent scan at any time by choosing *Save* from the *File* menu.

Scans can be saved as STL files, Thing files or other available file formats.

DISCARD THIS SCAN

If you're not happy with your scan, click **Discard this Scan** to delete the completed scan. Once you've accepted the delete confirmation prompt, MakerWare for Digitizer deletes the saved file from your Things or My Things folder and returns you to the New Scan screen.
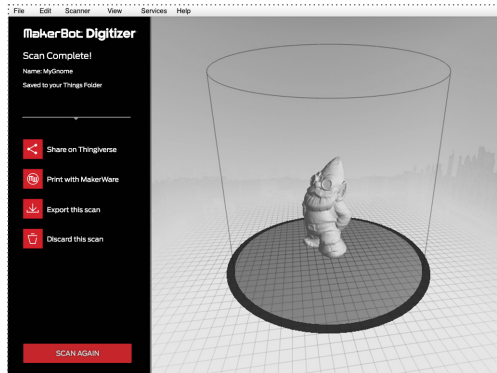
SCAN AGAIN

Click **Scan Again** to return to the New Scan screen.

4

Troubleshooting + Maintenance
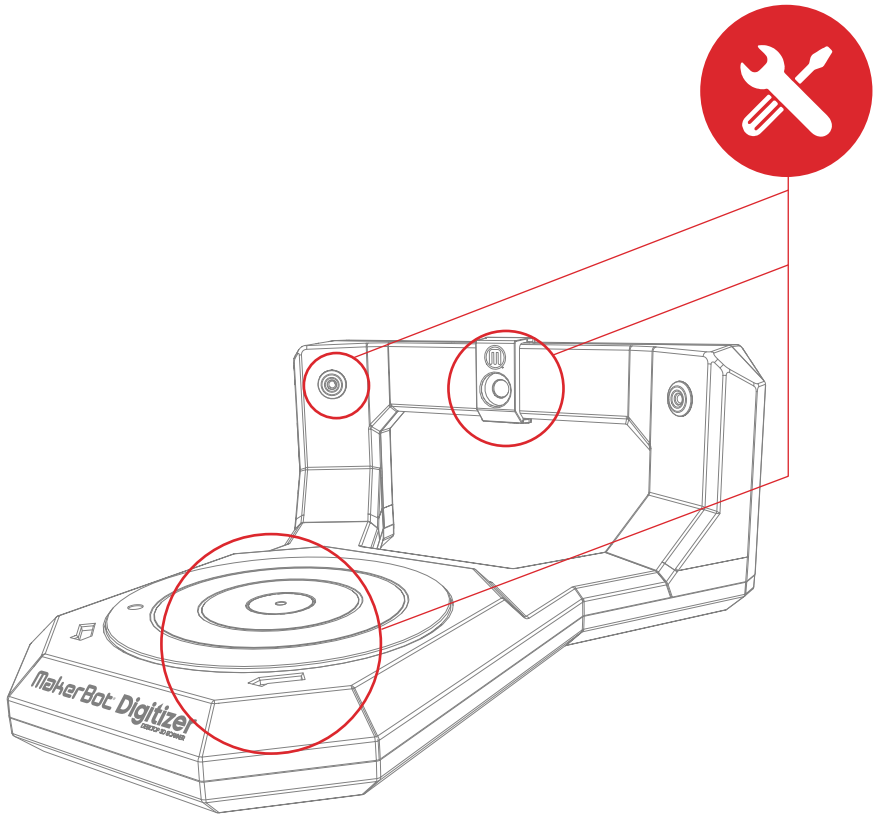
This chapter describes basic troubleshooting and maintenance tasks for your MakerBot Digitizer Desktop 3D Scanner.

For information on more advanced troubleshooting and maintenance tasks, go to **makerbot.com/support/digitizer**

PROBLEM	SOLUTION
The MakerBot Digitizer is connected via USB but MakerWare for Digitizer shows a "MakerBot Digitizer Not Connected" message	1. Ensure that the USB cable is connected to both your MakerBot Digitizer and your computer. 2. Choose Restart Background Service from the Services menu to restart Conveyor, the service that handles the connection of the MakerBot Digitizer to your computer. 3. Try restarting the MakerBot Digitizer, rebooting your computer, or using a different USB port or USB cable. If MakerWare for Digitizer still does not recognize your Digitizer, please contact MakerBot Support by emailing support@makerbot.com
The calibration routine fails	If the calibration routine fails during the turntable or laser calibration section, run the routine again by choosing *Calibrate Turntable & Lasers* from the *Scanner* menu. If the calibration routine fails during the camera calibration section, run the routine again by choosing *Calibrate Camera* from the *Scanner* menu. Then choose *Calibrate Turntable & Lasers* from the *Scanner* menu to finish the complete calibration routine. If a calibration section fails for a second time, please contact MakerBot Support by emailing support@makerbot.com

PROBLEM	SOLUTION
The camera feed does not appear in the viewport on the New Scan screen	1. Restart the MakerBot Digitizer, reboot your computer and make sure the USB cable is connected to both the computer and the MakerBot Digitizer. 2. Choose Restart Background Service from the Services menu to restart Conveyor, the service that handles the MakerBot Digitizer's connection to your computer. 3. If the camera feed still does not appear, contact MakerBot Support by emailing support@makerbot.com
The point cloud does not build during a scan	No points appearing in the viewport during a scan is a sign that the camera is not gathering any data. Check to ensure that the lasers are projecting red light onto your object, and make sure that the camera filter is positioned over the camera lens. If the lasers are functioning and the camera filter is in the correct position, please contact MakerBot Support by emailing support@makerbot.com

TROUBLESHOOTING

PROBLEM	SOLUTION
A scannable object results in a poor scan	1. Check the Object Placement guidelines on page 38 and ensure that your object is well positioned on the turntable. Some objects may scan better in other positions. Try placing it somewhere else on the turntable.
	2. Check the Placement section on page 28 and ensure that the lighting conditions around your MakerBot Digitizer are appropriate for scanning.
	3. Check that you are using the most appropriate scan preset. If you are unsure which shade category best fits your object, try a different one. Keep in mind that some objects may not scan well using any preset.
	4. If your object is placed well and the lighting is appropriate, but your scans are consistently poor, you might need to recalibrate your lasers and turntable. Clean the camera filter using the directions on page 58 and run both the camera calibration routine and the turntable and lasers calibration routine from the *Scanner* menu.
You receive a "Scan Failed" message	This means that MakerWare for Digitizer is not collecting any data. If your object adheres to the guidelines listed on page 21, there may be a problem with the MakerBot Digitizer's connection to your computer. Follow the directions for dealing with a connection problem on page 54.

PROBLEM	SOLUTION
You receive a "MultiScan Failed" message.	MultiScan Technology could fail to merge your scans if: • You attempted to combine scans of two different objects • Lighting conditions changed between your first and second scans • Your object is fuzzy, reflective, transparent, or very dark, and produced widely different sets of scan data for each scan. MultiScan Technology should only be used to combine scans of the same object, scanned under similar conditions. If MultiScan Technology fails to merge your scans, MakerWare for Digitizer will revert your scan to its previous state.

MAINTENANCE

Show Us What's not Working

When an object is too shiny, fuzzy or translucent – or just too complicated a shape – no amount of correct lighting, object placement or calibration can get a great scan out of it. We're working on making some of those unscannable objects scannable, and you can help by sending us information on objects that didn't scan well. Email FailScan@makerbot.com and attach your STL or Thing file, along with a photo of the object you were trying to scan. We'll use that data to improve MakerWare for Digitizer.

Camera Care

Keep your camera clean and free of debris to ensure the best quality scan. If at any time the camera filter appears dusty or dirty, follow these steps to clean it:

1. Turn off the MakerBot Digitizer.

2. Use canned air to remove any particles from the filter surface.

3. Moisten a lint-free cloth, lens tissue or cotton swab with isopropyl alcohol.

4. Gently wipe the surface in a circular motion to remove residue.

⚠ **Caution:** Do not immerse the camera filter in any type of liquid. Do not use glass cleaner or water to clear camera filter.

Calibration

Recalibrate the MakerBot Digitizer's turntable and lasers approximately once a week or every 20 scans to maintain optimal scan quality. To run the calibration routine, go to the *Scanner* menu and choose *Calibrate Turntable & Lasers*.

Laser Alignment

MakerWare for Digitizer will correct small changes in laser alignment by itself, so you will probably never need to manually adjust laser alignment. However, if the MakerBot Digitizer is jarred or shaken the lasers could be misaligned badly enough that they will need to be manually adjusted.

Contact MakerBot Support by emailing support@makerbot.com and confirm that the lasers are misaligned before manually adjusting the lasers. The lasers are misaligned if a laser line is clearly not vertical or if the two laser lines intersect at a point other than the center of the turntable.

Each laser has two adjustment screws. The inner screw on each side adjusts the direction of the laser. The outer screw adjusts the angle of the laser. During the laser alignment process, you will use the T15 Torx driver to adjust the angle and direction of each laser.

TO MANUALLY ADJUST LASER ALIGNMENT

1. Choose *Align Lasers* from the *Scanner* menu. Both lasers will turn on.

2. Place the calibration tool on the turntable with the letter **A** pointing up and fit the tab on the lower edge of the calibration tool into the hole at the center of the turntable. Orient the tool so that the front panel faces away from the camera.

3. Adjust the angle of the left laser using the T15 Torx Driver. You will feel the screw click as the laser turns in increments. Turn the outer adjustment screw **[4]** so that the laser line is as vertical as possible. Turn the screw clockwise to turn the laser line clockwise and turn the screw counter-clockwise to turn the laser line counter-clockwise.

   ⚠ **Caution:** The range of the angle adjustment screw is limited. Do not use excessive force to turn the screw.

4. Adjust the direction of the left laser. Turn the inner adjustment screw **[3]** so that the laser line lines up with the spine of the calibration tool. Turn the adjustment screw clockwise to move the laser line to the left or counter-clockwise to move the laser to the right.

5. Adjust the angle of the right laser. You will feel the screw click as the laser turns in increments. Turn the outer adjustment screw **[1]** so that the laser line is as vertical as possible. Turn the screw clockwise to turn the laser line clockwise and turn the screw counter-clockwise to turn the laser line counter-clockwise.

⚠️ **Caution:** The range of the angle adjustment screw is limited. Do not use excessive force to turn the screw.
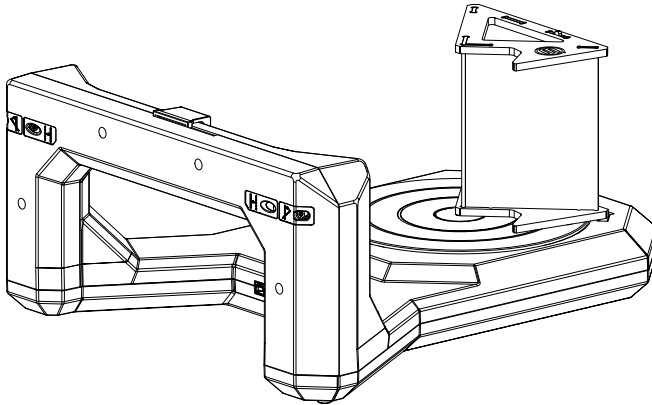
1. Adjust the direction of the right laser. Turn the inner adjustment screw **[2]** so that the laser line lines up with the spine of the calibration tool. Turn the adjustment screw clockwise to move the laser line to the right or counter-clockwise to move the laser to the left.

CALIBRATION TOOL POSITION

LASER ADJUSTMENT SCREW LOCATIONS

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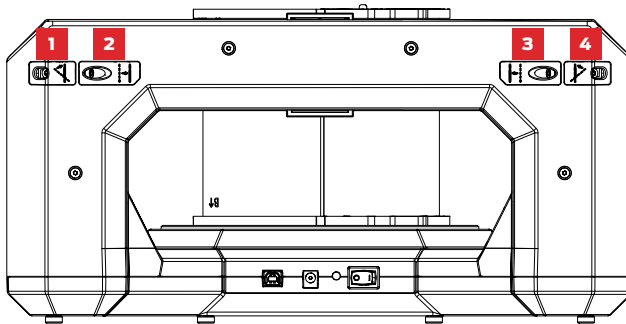
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Reference

This chapter includes hardware and software specifications for your MakerBot Digitizer Desktop 3D Scanner, a list of the menu options available in MakerBot MakerWare for Digitizer and a glossary to help you understand terms you may be unfamiliar with.

SPECIFICATIONS

Scanner Specifications

SCANNER

Scan Technology	Laser Line Triangulation
Scan Volume	203 x 203 mm (8 x 8 in) cylinder

SOFTWARE

Software Bundle	MakerBot MakerWare™ for Digitizer
File Types	STL, Thing
Supports	Windows (7+) Mac OSX (10.7+) Ubuntu Linux (12.04+)

PHYSICAL DIMENSIONS

Length	474.5 mm [18.68 in]
Width	412.0 mm [16.22 in]
Height	203.9 mm [8.03 in] including rubber feet
Weight	2.1 kg [4.7 lbs]
Shipping Box	521 (L) x 244 (H) x 470 (W) mm [20.5 x 9.6 x 18.5 in]
Shipping Weight	4.3. kg [9.5 lbs]

TEMPERATURE

Ambient Operating Temperature	0º–32º C [32º–90º F]
Storage Temperature	0º–32º C [32º–90º F]

ELECTRICAL

AC Input	100 – 240 V, ~2 amps, 50 – 60 Hz
Power Requirements	12 V DC @ 2.08 amps
Connectivity	USB
Lasers	2x Class 1 Laser Line Generators
Sensor	1.3MP CMOS Image Sensor

MECHANICAL

Enclosure Material	PC ABS
Central Bearing	Shielded Chrome Ball Bearing
Stepper Motor	0.9º step angle with 1/16 micro-stepping

MENU FUNCTIONS

This section describes the menu options available in MakerWare for Digitizer.

FILE

Export: Allows you to save the currently open scan under the name, location and file type of your choice.

Share: Opens the Share to Thingiverse dialog. This option will not be available if no scan is open or if the open scan has not yet been saved.

Open in MakerWare: Opens a new MakerWare window with the most recent scan open. This option will be available only after the scan has been saved.

Settings: Displays the settings available for MakerWare for Digitizer. On a Mac, this option will appear as *Preferences* in the *MakerWare for Digitizer* menu.

Close: Quits MakerWare for Digitizer. If a completed scan is open but has not been saved, a dialog will alert you and ask you to confirm that you wish to quit MakerWare for Digitizer. On a Mac, this option will appear as *Quit* in the *MakerWare for Digitizer* menu.

VIEW

Home View: Resets the viewport to the home position.

Front View: Sets the viewport to a front view.

Top View: Sets the viewport to a top view.

Side View: Sets the viewport to a side view.

SCANNER

Calibrate Camera: Runs the camera calibration portion of the MakerBot Digitizer calibration routine.

Calibrate Turntable & Lasers: Runs the turntable and laser portions of the MakerBot Digitizer calibration routine.

Align Lasers: Turns on both lasers for manual alignment.

Update Firmware: Walks you through the process of uploading new firmware to your MakerBot Digitizer. If MakerWare for Digitizer is connected to the internet, it will notify you when a firmware update becomes available.

New Scan: Brings you to MakerWare for Digitizer's New Scan screen.

SERVICES

Restart Background Service: Allows you to restart Conveyor, the service that handles MakerWare for Digitizer's connection to the MakerBot Digitizer.

View Background Service Log: Opens the log file for Conveyor, the service that handles MakerWare for Digitizer's connection to the MakerBot Digitizer.

HELP

Online Help: Directs the user to online support documentation.

About MakerWare for Digitizer: Displays a dialog with version and copyright information. On a Mac, this option will appear in the *MakerWare for Digitizer* menu.

GLOSSARY

CALIBRATION ROUTINE: The step-by-step process MakerWare for Digitizer uses to accurately locate its cameras, turntable and lasers.

CALIBRATION TOOL: A geometrically specific object with a checkered surface that is used for the calibration of the camera of the MakerBot Digitizer, turntable and lasers.

CAMERA FILTER: A filter that reflects all wavelengths other than the lasers' wavelength, ensuring that the MakerBot Digitizer's camera only sees the laser lines on your object.

CLASS 1 LASER: The class of laser used in the MakerBot Digitizer. Class 1 lasers are safe under all conditions of normal use.

DARK/DIFFICULT TO SCAN (SCAN PRESET): One of three available scan presets used to describe the shade value of an object. This preset should be used on dark objects, very shiny objects, or objects with a fuzzy texture. Keep in mind that these objects might not scan well using any preset.

DATA POINT: A single piece of information describing a location on the surface of the object being scanned. A point cloud is composed of individual data points.

FUZZY: Having a surface covered in small hairs or fibers. Fuzzy objects are difficult to scan with the MakerBot Digitizer.

LASER DIVERGENCE: An angular measurement of the increase in a laser beam's diameter with distance from the laser aperture. The MakerBot Digitizer Class 1 laser divergence is 1 Radian x < 5 mRadians.

LIGHT (SCAN PRESET): One of three available scan presets used to describe the shade value of an object. The Light preset should be used on white and light-colored objects.

MAKERWARE: Free software created by MakerBot that allows you to send 3D models to a MakerBot 3D printer for building. Models can be sent to MakerWare directly from MakerWare for Digitizer.

MAKERWARE FOR DIGITIZER: Free software created by MakerBot and used to control the MakerBot Digitizer Desktop 3D Scanner.

MANIFOLD: A term used to describe 3D models that consist of one completely enclosed three-dimensional shape with no holes, reversed faces or extra geometry. Non-manifold models will cause problems for 3D printing and other applications.

MAKERBOT DIGITIZER: The MakerBot Digitizer Desktop 3D Scanner.

MAKERBOT THINGIVERSE: A website for sharing and downloading 3D model files and other designs.

MAXIMUM PERMISSIBLE EXPOSURE (MPE): A rating used for laser safety calculations. The MPE is the highest amount of exposure to a light source that is considered safe.

MEDIUM (SCAN PRESET): One of three available scan presets used to describe the shade value of an object. The Medium preset should be used on brightly colored objects and objects that are neither light nor dark.

MESH, 3D: A collection of vertices, edges and faces used to describe the shape of a an object in three dimensional computer graphics and modeling.

MULTISCAN TECHNOLOGY: A feature of MakerWare for Digitizer that allows you to scan an object from multiple angles and merge the scans to create a better 3D model.

MY THINGS FOLDER: The directory where MakerBot Digitizer scans are saved by default. On Mac computers, this directory is called the Things folder.

OPAQUE: An opaque object is one that does not allow light to pass through it. Opaque objects are easier to scan with the MakerBot Digitizer than transparent or translucent objects.

POINT CLOUD: A set of data points that represent an object in a three-dimensional coordinate system.

SCAN CYLINDER: The cylindrical area inside of which the MakerBot Digitizer collects data. To be scanned, an object must fit completely inside the scan cylinder.

SCAN PRESET: A setting used to describe an object's shade value to the MakerBot Digitizer. The three scan presets are Light, Medium and Dark/Difficult to Scan.

STL FILE: A widely used file format for 3D models. STL files describe only the surface geometry of a three-dimensional object without any representation of color, texture or other common CAD model attributes.

THING FILE: A file format used by MakerBot software that allows you to save multiple 3D models to the same file and to save other information about the models it contains, including size and location.

THINGS FOLDER: See "My Things folder".

TRANSLUCENT: A translucent object allows light to pass through it, but diffuses the light so that objects on the other side of it are not clearly visible. Translucent objects are more difficult to scan than opaque objects.

TRANSPARENT: A transparent object allows light to pass through without diffusing it, so that objects on the other side of it are clearly visible. Transparent objects are more difficult to scan than translucent or opaque objects.

TURNTABLE: The revolving platform on which you will place the object being scanned.

VIEWPORT: The window in MakerWare for Digitizer where the camera view, point cloud, and 3D mesh are displayed.

WAVELENGTH: A measurement used to describe any form that travels as a wave, e.g. light, sound, and lasers. Laser wavelengths are measured in nanometers. The wavelength of the Class 1 lasers used in the MakerBot Digitizer is 650nm.

CONTACT US

Support

makerbot.com/support
Our website has extensive documentation and troubleshooting information about your MakerBot Digitizer Desktop 3D Scanner. It's a great resource when you want to try to solve issues quickly on your own.

support@makerbot.com
If you ever need help resolving an issue with your MakerBot Digitizer, send an email to the address above to open a ticket with the MakerBot Support Team. To help us understand your problem from the start, it is very helpful to include pictures or a video as attachments on your email.

Sales

sales@makerbot.com
To learn about other MakerBot products, please email the address above or call our Sales Team at 1-347-334-6800.

Feedback

thoughts@makerbot.com
For general questions, or to tell us what's on your mind, send an email to the address above. We love to hear from you, and using this email address helps keep our Sales and Support lines free for customers in need.

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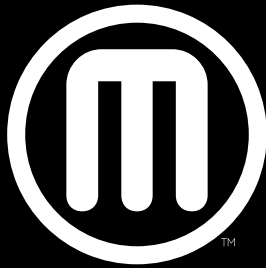# Terms

Warranty, Returns + Replacement Policy

MakerBot products do not carry a long-term warranty. Returns are possible only on unaffected items, within 30 days of receipt. After such time, all sales are considered final. "Unaffected" means a device has never been assembled, powered up, programmed, or otherwise changed. MakerBot cannot accept returns on purchased items that have had electrical power applied to them, or been otherwise programmed, changed, or affected. However, we will provide parts or service on items that prove to be defective from the time of manufacture, and we'll always work with you to get your bot running again.

Terms of Service

Please be advised of the following terms (the "Terms") regarding this User Manual (the "Manual"):

All information in this Manual is subject to change at any time without notice and is provided for convenience purposes only. MakerBot reserves the right to modify or revise the Manual in its sole discretion and at any time. You agree to be bound by any modifications and/or revisions. Contact the MakerBot Support Team for up-to-date information.

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MakerBot