



3M™ ESPE™ Lava™ Chairside Oral Scanner User Guide Version 3.0

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General Information

The 3M ESPE Lava C.O.S. is used to capture high-accuracy scans of human teeth. Data from these scans are used in manufacturing oral prostheses, such as crowns, inlays, and onlays. The main system components are:

Scanning wand – A freehand, high-accuracy video camera used to acquire three-dimensional data in real-time. The wand's cable connects to the cart assembly and can be detached.

Touch screen display – A touch-enabled screen used to display and control the acquired images, scans, and video. The touch screen is also used to interact with the system software, by entering patient information, prescriptions, and so on.

Computer – Self-contained control system that houses the processing, storage, and interface capabilities of the unit.

Cart assembly – Provides cable management and mounting locations for the other components. It is equipped with locking wheels for stability.

Components of the Lava Chairside Oral Scanner



Trademarks

3M ESPE Lava Chairside Oral Scanner is a trademark of 3M ESPE and Brontes Technologies, a 3M Company. All rights reserved.

About the Lava C.O.S. User Guide

This guide is designed for operators of the Lava Chairside Oral Scanner (C.O.S.). It contains information on the proper use of the system, including the care and handling of system components; cleaning and disinfection procedures and safety information. It also contains instructions for interacting with the system and performing scans.

Read this guide before using the device, taking special note of the cautions and warnings herein.

Note: No person is authorized to provide any information which deviates from the information provided in this User Guide.

Troubleshooting

The Chairside Oral Scanner is *not* a field-serviceable device. If it ever fails to operate, or if you encounter any problems using the device, call 3M ESPE Customer Support at: 1-877-SCAN-LAVA (1-877-722-6528) for service. Do not attempt to open or service the system yourself; only authorized personnel may service the device.

Documentation

The complete documentation set delivered with this device includes this guide and the one-page laminated card, *Lava™ Chairside Oral Scanner Quick Reference Guide*.

Training materials, which are a part of a 3M ESPE training program, are available under separate cover for those who receive training. Contact your 3M ESPE representative or Customer Support for information.

Problem Reporting and Suggestions

Your comments are important to us. You can influence the quality and future design of the system and its documentation. Please submit problems, questions, enhancements, and recommendations to the 3M Customer Service and Support Center by phone, mail, e-mail, or fax.

Support Contact Information

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10 Maguire Road, Suite 310

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Customer Support and Service: 1-877-SCAN-LAVA (1-877-722-6528)

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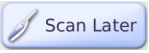
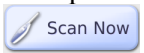
Lava C.O.S. Quick Reference Guide

This Guide describes only the basic steps involved in using the Lava C.O.S. For details on using the scanner in a clinical setting, refer to your training materials.

Start up Your System


1. Plug in the power cord and press the **On** button  on the back of the cart.
2. When prompted, select your User Name .
3. Enter your PIN and select **log in**.

Enter in a New Patient and Prepare to Scan

1. On the Home screen, touch the Patients icon  to display the **Patients** screen.
2. Touch the **Add New** button .
3. Select the **Last Name**, **First Name**, etc. fields in the Patient box, then type in patient data using the on-screen keyboard. Press **Enter** to complete each field.
4. Verify the patient information, then select **Save** to save the patient data.
5. Touch **Scan Later**  to place the patient in the Pending Patients list (on the Cases in Progress tab) or **Scan Now**  to display the scanning interface, in which you can scan immediately.








Basic Scanning Workflow (single prep)

For details, see your Lava C.O.S. training materials.


1. On the Scanning toolbar, select the arch to be scanned.
2. When ready to scan, press the **Start/Stop**  button on the toolbar (or on the wand keypad).
3. Scan the prepared tooth and contact walls of the adjacent teeth.

Important: Do not repowder or change the field any time the wand is flashing.


4. Select the **Add Prep**  button.

5. Select the prep number of the tooth, then touch the prep on the scan to highlight it.
6. Select  to review (or the X Mark  to start again.) The system displays still images for your review.
7. Tap the screen where you want to see a close-up of the still image. Review the image(s) to make sure the margin is clearly visible.
8. Select the Check Mark  to approve the prep (or the X Mark  to start over).
9. Scan the remainder of the operative quad. The system will merge this scan with the prep scan. Review and approve the merged scan.
10. Scan the opposing quad, review and approve.
11. Select a bite icon  then scan the bite. The system will register the upper and lower arches with the bite scan.
12. Accept or reject the bite registration with  or .

Prescription

1. Select the **Rx tab** on the Scan screen to display the **Prescription** screen.
2. Follow the on-screen instructions to request a delivery date, select a lab, and enter specific Rx information, e.g., type of crown, material, shade, etc.
3. When done, review the information, then select the **Sign** button  to display the **Rx Digital Signature** screen.
4. Enter your PIN to sign the prescription.

Log Out/Shut Down

Select the **Power** button  then select **Log Out** or **Shut Down**.

Safety



ATTENTION!

Read these instructions carefully. To prevent injury to persons and equipment, you must comply with the warning and precautions in this manual. As with all technical systems, proper functioning and safety can only be guaranteed for this unit if both generally applicable safety precautions and the specific safety information in these instructions and on the Lava C.O.S. device are observed.

Normal Use

The Lava Chairside Oral Scanner is used to capture scans of human teeth. Use of the unit for any other purpose is not recommended and could damage the unit and void the warranty.

The software is thoroughly checked and tested before it is released.



CAUTION: The Lava C.O.S. is NOT a field-serviceable device. If you experience a problem with the system, call 3M ESPE Customer Support at 1-877-SCAN-LAVA (1-877-722-6528) to report the problem. Do not attempt to service the unit yourself or allow any unauthorized personnel to service the system.



CAUTION: The Lava C.O.S. should be used only by qualified dental professionals who have been thoroughly trained and are experienced in its use and, if relevant, have been trained on the particular device.



CAUTION: The equipment must be used in accordance with the procedures contained in this manual and must not be used for purposes other than those described. The information on the equipment is subject to change without notice.



WARNING: Electrical and fire hazards

- Install where the temperature range is 50° to 95° Fahrenheit (10° to 35° Celsius). Usage outside that range can damage the system or affect system performance.

- Plug the Lava C.O.S. into a grounded power outlet to maintain patient and operator safety.
- Disconnect the Lava C.O.S. from its power source if it gets wet, if its cables are damaged, or if it falls. Then contact Customer Support.
- Do not block the vents on the back of the computer case or install it in a built-in enclosure. Blocked vents cause excessive heat to build up inside the system.



WARNING – Personal Injury. Do not open the computer casing. Opening the case will leave you vulnerable to severe electrical shock. Contact Customer Support for assistance.



WARNING – Shock Hazard. Do not plug the Lava C.O.S. into an Uninterruptible Power Supply (UPS).

EMI, FCC and Safety Standards Pending

This device has been tested and conforms to EMI, FCC and safety standards.

U.S. Federal Communications Commission (FCC) Requirements

This device was tested and complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. This equipment generates, uses, and can radiate radiofrequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

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 to 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.



Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.










To comply with the limits for an FCC Class A computing device, always use the shielded signal cord supplied with this unit. The FCC warns that changes or modification of the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Regulatory Label



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.

Meaning of Regulatory Symbols

	<p>Product has been tested and certified with electric shock, fire, mechanical and other specified hazards only in accordance with US 2601-1 and CAN/CAS C22.2 No 601.1 and IEC 60601-1 for medical equipment. If this mark appears with the indicators “C” and “US,” the product is certified for Canadian and U.S. markets, meeting the applicable Canadian and U.S. standards.</p>
	<p>Product has been tested to comply with FCC Class A standards.</p>
	<p>Indoor use only.</p>
	<p>Type B applied part.</p>
	<p>Consult accompanying documents.</p>
<p>IP22</p>	<p>Foreign body and moisture intrusion rating per IEC/EN60529. Protection against solid bodies: objects greater than 12mm. Protection against liquids: 75° – 90° dripping water.</p>
	<p>AC (alternating current) voltage.</p>
	<p>Do not dispose.</p>

Equipment Specifications and Classifications

This device is an optical impression taking system.

Field of View	~10mm x 13.5 mm at nominal depth
Working Depth	5mm to 15 mm from Wand tip
Direction of View	90° from long axis of Wand
Illumination	Narrow-band blue light
Video Capture Rate/Flash Rate	20 Hz
Touch Screen Size	432 mm (17 in.) diagonal
Dimensions of Cart Base (footprint)	64cm x 74 cm (25 in. x 29 in.)
Monitor Height Adjust	94cm to 107 cm (37 in. to 42 in.)
Monitor Tilt Adjust	+5° to -30°
Power Input	240V 60Hz 400W

Weights:

Total shipping weight	40.4 kg (89 lbs)
Cart	33 kg (73 lbs)
Touch Screen Display	7 kg (15 lbs)
Wand	390 g (14 oz)
Tether	250 g (9 oz)

Wand dimensions:

Length	33 cm (13 in.)
Circumference	17.8 cm (7 in.)
Diameter	5.7 cm (2.2 in.)
Tether cable length	2.99 m (9ft. 10 in.)

Temperature:

Operating	+10°C to +35°C (+50°F to +95°F)
Storage	-10°C to +50°C (+14°F to +122°F)

Humidity:

Operating	30% to 85% RH, non-condensing
Non-operating	10% to 85% RH, non-condensing

Altitude:

Operating	3.05 km (10,000 ft)
Non-operating	12.19 km (40,000 ft)

EMC:

FCC Class A - CISPR 11/ EN55011

Safety Standards

This system has been tested to conform with the UL 60601 Electrical Safety Standard for Medical Devices with a Patient applied Part.

Warranty

3M ESPE warrants this product will be free from defects in material and manufacture. Please refer to your Purchase and Sales agreement for full warranty terms. 3M MAKES NO OTHER WARRANTIES INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. User is responsible for determining the suitability of the products for user's application. If this product is defective within the warranty period, your exclusive remedy and 3M ESPE's sole obligation shall be repair or replacement of the 3M ESPE product.

Limitation of Liability



Except where prohibited by law, 3M ESPE will not be liable for any loss or damage arising from this product, whether direct, indirect, special, incidental or consequential, regardless of the theory asserted, including warranty, contract, negligence or strict liability.

Care, Maintenance, and Handling of the Lava C.O.S.

Follow these guidelines when using the device:

- The device is to be used only by qualified operators who have been trained by 3M ESPE.
- Keep the cooling vents, located on the rear of the Lava C.O.S., clear of lint and debris. Do not allow the vents to be blocked.
- The air inlet slots, which are located on the side panels at the front of the Lava C.O.S., should remain free of dust. Vacuum these slots at least annually to remove any accumulation of dust.
- Deploy the caster locks to lock the wheels of the cart in place.
- Store and use the Lava C.O.S. within prescribed temperature, humidity, and altitude limits. (Refer to “Equipment Specifications and Classifications.”)

Cautions and Warnings

-  **WARNING:** Do not place the cart on a slope greater than 10 degrees.
-  **CAUTION:** Do not break or alter any existing connections on the Lava C.O.S., for example, the connection between the device and the display screen. The only exception is the wand, which must be unplugged for cleaning and disinfection. (See “Cleaning Procedures” and “Disinfection Procedures” sections below.)



Scanning wand



CAUTION: The scanning wand is a highly-precise, multiple-lens instrument. Improper handling of the wand, such as dropping, shaking or bumping, could cause the wand to malfunction or break. Always follow these guidelines:

- Exercise great caution when handling the scanning wand.
- Return it to one of the holsters when it's not in use.
- Do not kink the cord that connects to the back of the wand.
- Do not submerge the wand or its cord in any liquids.



CAUTION: Examine the wand and the system (cart, screen, etc.) for physical damage before each use. Look for any loose parts, sharp edges or signs of wear or damage that could interfere with its proper use. Contact Customer Support if there is visible damage or if the device does not perform as expected.

NOTE: Wands are not necessarily interchangeable among Lava C.O.S. units. If you have more than one Lava C.O.S., you may not be able to plug in the wand from one Lava C.O.S. unit into another unit. Contact Service and Support: 1-877-SCAN-LAVA (1-877-722-6528) or email cossupport@mmm.com if you have any questions.

Cleaning Procedures

After each patient, clean the touch screen, bezel (the border that frames the touch screen), the body of the wand and the tether cord.

You do not need to shut down the Lava C.O.S. while cleaning its surfaces, but you may want to log out before cleaning the monitor.



CAUTION: Pressing and holding the power button on the back of the computer chassis to turn off the Lava C.O.S. can cause major system damage. A quick press of the power button when the scanning interface is not displayed will cause the system to shut down normally. It is recommended you shut down the system via the power button on the touch screen.



Do not detach the tether cord from the wand when cleaning or disinfecting. If the area where the cable connects to the wand should be submerged or get wet, then the cable will need to be disconnected and the contact areas dried with compressed air.

The following agents are approved for cleaning the touch screen, bezel, wand body, and tether cord surfaces:

- BIREX®se (by Biotrol) or equivalent
- CaviCide® (by TotalCare Kerr/Metrex) or equivalent
- Warm water and mild, non-abrasive detergent: Fantastic®, Formula 409®, Lysol cleaner or equivalent

(70% IPA [isopropyl alcohol] can also be used to clean the touchscreen, but not the other surfaces. Avoid contact with skin.)

BIREXse is a registered trademark of Biotril.
CaviCide is a registered trademark of Kerr/Metrex Corporation.

To clean the touch screen, bezel, wand body, and tether cord (and other cart surfaces as needed):

1. Apply the cleaning agent to a soft, non-abrasive cloth.
2. Wring out the cloth until damp.
3. Wipe down the surfaces with the damp cloth.
4. Rinse the cloth in clean water.
5. Wipe down the surfaces a second time.
6. Dry the body of the wand and the tether cord with a clean, non-abrasive cloth. The touch screen and bezel can air dry.



Do not spray or pour liquids on these surfaces.



Never submerge the scanning wand.



Do not use ammonia-based cleaners on these surfaces.

Disinfection Procedures

While a patient is being scanned, the wand should be barriered. Approximately one inch of the distal tip of the wand should be exposed during scanning so that the sheath does not obscure the lens. Follow standard barrier procedures while using the scanner.

To prevent cross-infection, the tip of the wand must be disinfected before each use. Follow these procedures:

1. Unplug the wand from the dental workstation by pulling gently on the textured portion of the connector from the back of the unit. (The unit itself can remain on.)



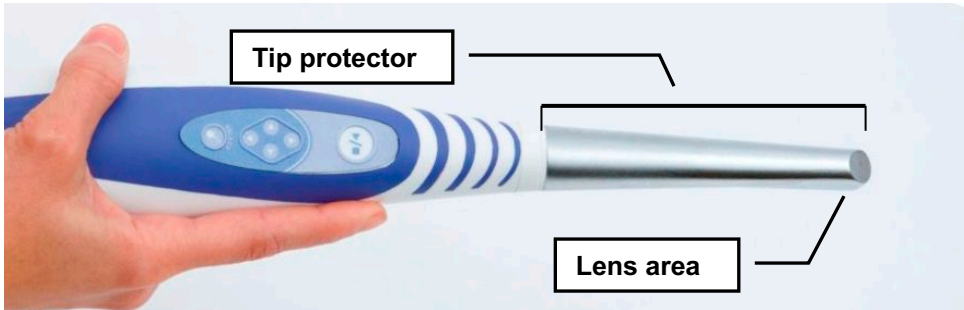
Connector

2. Loop the wand's cord to make it portable. If you have the type of wand whose cord can be detached from the wand, do **not** detach it.

***Important Note:** If the area where the cable connects to the wand is submerged or gets wet, the cable will need to be disconnected and the contact areas dried with compressed air.

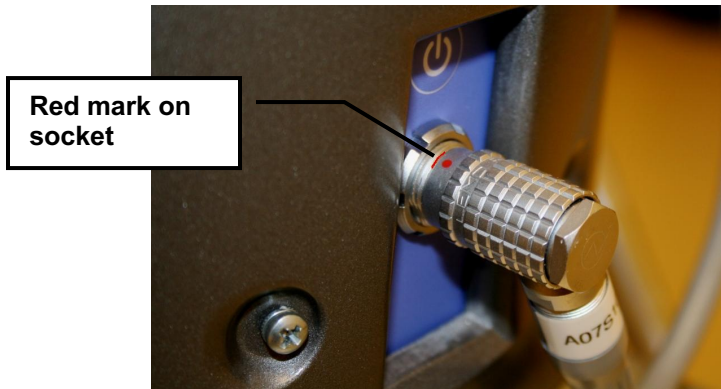
3. Clean the lens area of the wand for two minutes using a soft-bristled brush and enzymatic detergent prepared with warm tap water (100-120°F).

4. Rinse the wand tip with clean tap water for at least one minute. Do **not** submerge the wand.
5. Dry the wand with a clean, lint-free wipe.
6. Prepare the Birex solution according to the manufacturer's recommendations.
7. Spray and wipe the tip of the wand, from the lens to the end of the tip protector (the silver metal section). Wet all surfaces of the tip protector completely with the Birex solution.



8. Allow the wand to stand for ten minutes. (The tip protector and the lens should be completely wet by the Birex solution.)
9. Completely wipe down the lens area with a lint-free wipe soaked in Birex.
10. After disinfection, rinse the lens area of the wand with one liter of sterile water.
11. Dry and barrier the wand.

When the wand and its tip are cleaned and disinfected, slide a barrier sheath over the tip protector, return the wand to its holster and plug the connector back into the device. Make sure the red dot on the connector aligns with the corresponding mark on the socket.



Align red dot to mark on socket

Pre-Use Check

After disinfection, and before using the Lava C.O.S. to scan a patient, we recommend that a dental professional, whether dentist, hygienist or assistant, perform a visual check of the Lava C.O.S.

When performing a visual inspection, look for cracks in the wand or cord, kinks in the cord, discoloration, corrosion, or damage of any kind. Check to make sure the wand and its tip and lens are clean.

Wireless Network Connection

The Lava C.O.S. comes with a wireless access point that a 3M ESPE representative will install at the dentist office.

Many dentist locations will have an existing intranet network with a router that is either store-bought or supplied by the location's ISP. Before installation, 3M ESPE will conduct a site survey to determine whether the location's network meets our requirements. If it does, we will connect the access point device to that router using a standard networking cable.

If the existing network at the location does not meet 3M ESPE requirements, modifications to that network must be made before installation can take place.

Other Network Connection Details

- The access point comes with a 2-prong transformer-style plug.
- The 3M ESPE access points can be used only by the Lava C.O.S.

Turning On and Logging In to the System

Powering On:



CAUTION: Be sure that the power cord is unplugged before moving the system.

1. Plug the power cord into a wall outlet. (Make sure the other end is plugged into the back of the cart.)



Power cord

2. Press the power button on the back of the CPU chassis.



Power button

The system will turn on and display the login screen.



CAUTION: Plugging in and turning on the system are the only power- or service-related interactions a user should have with the Lava C.O.S. If the system fails to function properly, call Customer Support. Do **not** attempt to open or service the unit yourself. Attempting to open or service the unit yourself could damage the unit and void the warranty.

To log in to the system:

1. Select your User Name.
2. Enter your personal identification number.
3. Select the Login button.




Log In screen

To log out of the system:

1. Select the Power  icon.
2. Select **Log Out**.

To shut down the system:

1. Select the Power  icon.
2. Select **Shut Down**.
3. When prompted, confirm your request.

Note: If the Lava C.O.S. alerts you that there are cases remaining that need to be processed or uploaded, it is recommended that you leave the system on.

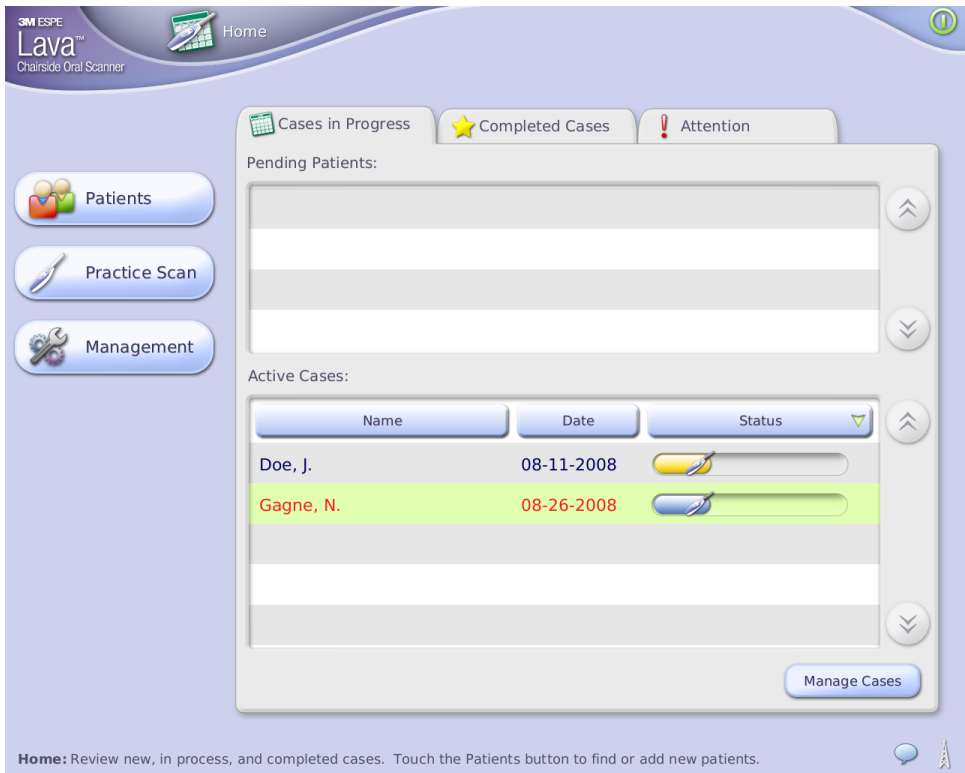


CAUTION: Do not unplug the Lava C.O.S. before logging out of, and then shutting down, the system. Unplugging without properly shutting down first may corrupt the operating system of the Lava C.O.S.

The Home Screen

After you log in, the Lava C.O.S. displays the home screen, which enables you to:

- Add new patients
- Find existing patients
- View cases and their status
- Launch a practice scan
- Access the Management screens
- Receive system message alerts
- See the status of the Case Manager connection

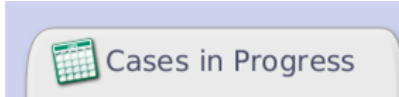


Home screen

There are three tabs on the Home screen:

- Cases in Progress
- Completed Cases
- Attention

Cases in Progress Tab

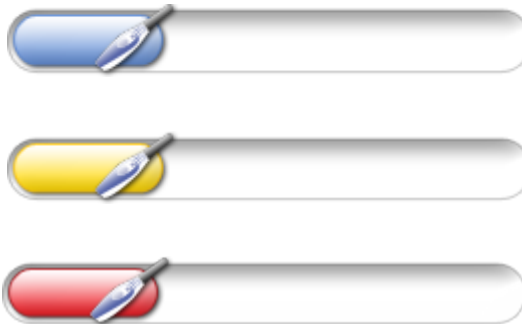


This tab contains all pending patients and all active cases. If patients have been previously entered into the system and the user has selected the Scan Later button for them (see Scan Now and Later buttons in this section), they are identified as **Pending Patients**.

Patients stay on the Pending Patients list until they are scanned. If a Pending Patient remains unscanned for 30 hours, the patient is deleted from the Pending Patient list. The patient remains available in the patient records.

Active Cases are cases with at least some information associated with them, for example, a scan or some prescription information. Cases are considered “active” until their prescriptions have been signed.

The status bar associated with a case is color coded: blue means things are normal and no attention is required; yellow means the case requires your attention; red means a higher level of attention is needed and it may be necessary to call Customer Service. See Appendix A for details. The message line provides additional information and instructions, if needed.



Display an Active Case

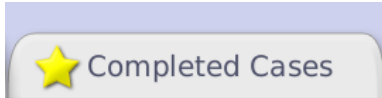
To see the scan or the prescription of an active case, touch the case in the Active Cases list. Then touch either the Scan tab to display the case's scan or the Prescription tab to display its prescription. Scanning and Prescriptions are explained in detail later in this guide.

Delete an Active Case

If you want to delete an active case, touch the **Manage Cases** button. The Manage Cases screen is displayed. Select the case to delete, then touch the **Delete Case** button.

You will need to enter your PIN before completing a deletion.

Completed Cases Tab

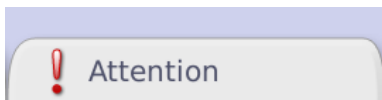


The **Completed Cases** tab lists the cases whose scans and prescriptions are complete.

Completed cases will remain on this list for 7 days after they have been uploaded. Then they will be stored automatically.

After a case has been completed and uploaded, you can access it in the patient records.

Attention Tab

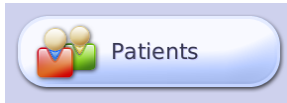


The **Attention** tab does what its name implies: it displays cases that, for whatever reason, require your attention. For example, if scans have been performed but not yet uploaded, those cases would be listed here.

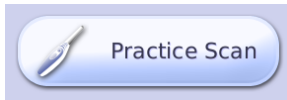
When you turn on the Lava C.O.S., the Attention tab displays first if something needs your attention.

When you select an item, the message box at the bottom of the screen displays the reason it needs attention.

The three buttons on the Home screen are Patients, Practice Scan, and Management.



Touch the **Patients button** to add new patients to the Lava C.O.S. or search for existing patients. This is described in detail below.

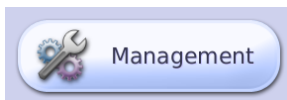


A **Practice Scan** works the same way a normal scan does. You can practice a scan and then review the resulting scan. There is no prescription to fill out when scanning is done.



You cannot save a practice scan or send it to a lab. When you leave the Practice Scan screen, all scans are deleted.

For more, see the section on Scanning.



Many management tasks are designed to be performed by 3M ESPE Customer Service, but there are a few features, like naming the device and adding a user you may use. See Appendix A: Management Screens, for details.

Other Home Screen Features

Message line

The Home Screen (as well as other screens) has a message line at the bottom that names the screen and gives a brief description of what you can do on that screen. For example: **Home: Review new, in process, and completed cases. Touch the Patients button to find or add new patients.**

System Message alert



The System Message Alert icon is at the bottom, right of the screen. If there are no messages, the icon is blue. If the icon is red with an exclamation point, there is a high priority system message to read.

If there is a message, touch the icon to display the Messages screen.

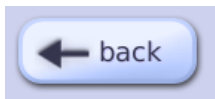
Case Manager Connectivity Status icon



The Case Manager Connectivity status icon is located next to the System Message Alert icon. The icons show whether or not a connection to the Case Manager is present.

Touch the icon to display more details.

Navigation: Back Button and Home Button



You'll find that navigating through the Lava C.O.S. screens is easy: just touch a tab or a button.

Some screens have a back button that returns you to the screen you were just viewing.

And you'll find the Home icon useful. Touch the Home button and you are returned to the familiar Home screen (or, in some cases, to the previous screen).

Reset PIN

A blue, rounded rectangular button with a white border and a slight shadow, containing the text "Forgot PIN?" in a dark blue, sans-serif font.

You can reset your PIN if you forget it.

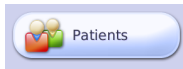
If you fail to enter the proper PIN when you sign in, the Lava C.O.S. will display the “Forgot PIN?” button. Touch that button, then enter a new PIN on the New Password screen that appears next.

To reset a PIN, you will need to know the Case Manager account number, or you can call our Customer Service number: 1-877-SCAN-LAVA.

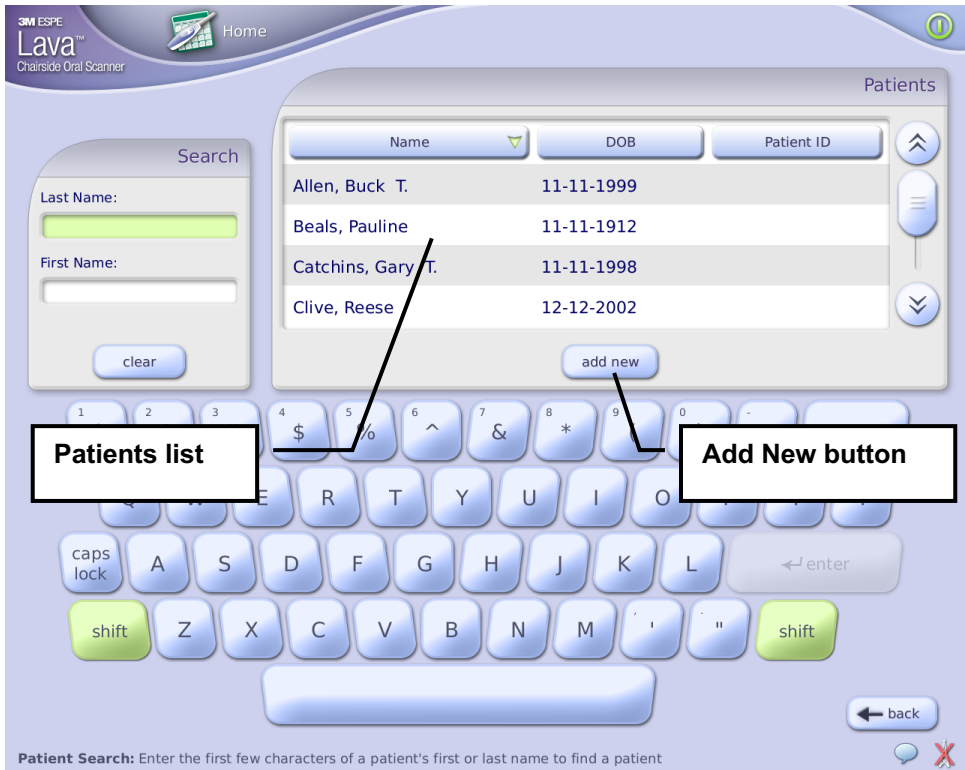
Search for a Patient/Add a New Patient

To search for an existing patient or add a new patient to the system:

Touch the **Patients** button



on the Home screen. The **Patient Search** screen appears.



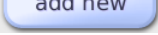
Patient Search screen

You have two options to **find a patient**:

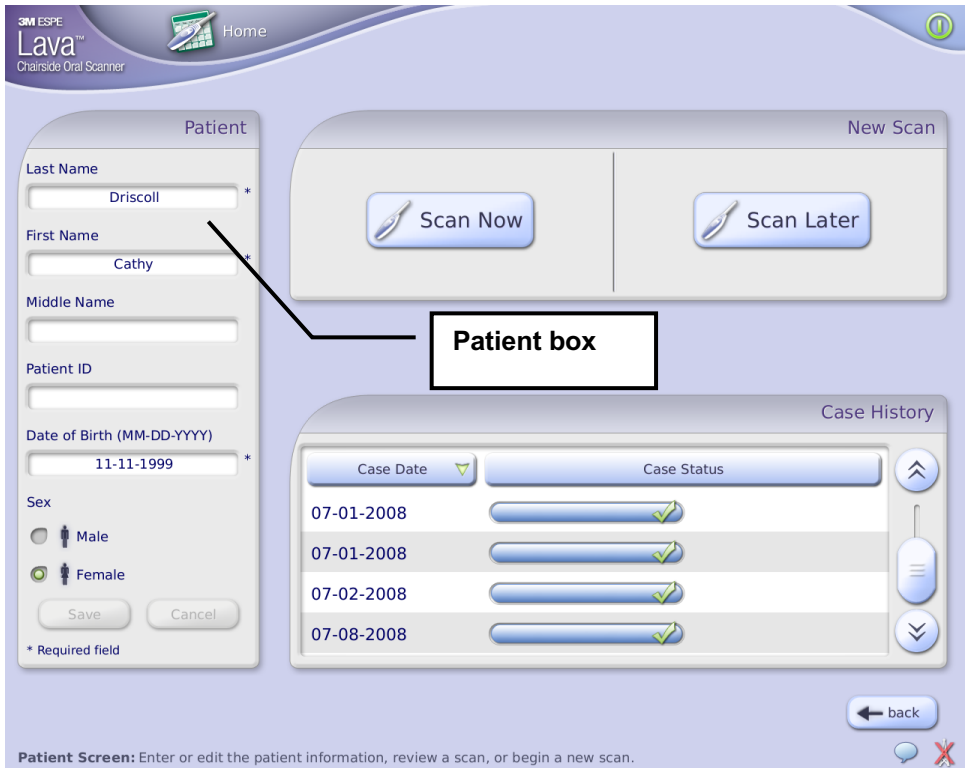
- Scroll through the Patients list.
- Using the on-screen keyboard, start to type the patient's name in the Last or First Name fields. The list of patients is filtered as you type.

After finding a patient, select the name from the list to display the Patient's screen.

To add a new patient:

1. Touch the **Add New** button  on the bottom of the Patients list.

The **Patient** screen is displayed.



Patient Screen

2. Touch a **Name entry** field, for example, **Last Name**, in the Patient box.

The entry field and an on-screen keyboard is displayed.



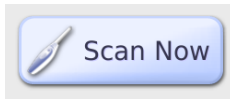
Last Name field and on-screen keyboard

3. Type on the on-screen keyboard to enter the patient's information (name, Patient ID*, DOB, etc.). Required Patient Information fields are shown with an asterisk.
4. Press the OK button to store the information in each field. To complete the date of birth, touch the Enter button.
5. When the information is complete, touch the **Save** button in the Patient box.

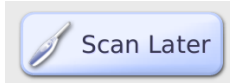
Note: You can also add a new patient by typing a last or first name in the **Search** box of the Patient Search screen, and then pressing the Add New button. When the Patient screen is displayed, the name you entered will be in the name field.

* The Patient ID is an optional, unique identifier created by the dental practice. If you do not know the Patient ID to enter, see your Office Manager or the person responsible for patient records.

After you have found or added a patient, select either the **Scan Now** or **Scan Later** button on the Patient screen.



-- Takes you to the Scan screen, described in detail later in this guide.



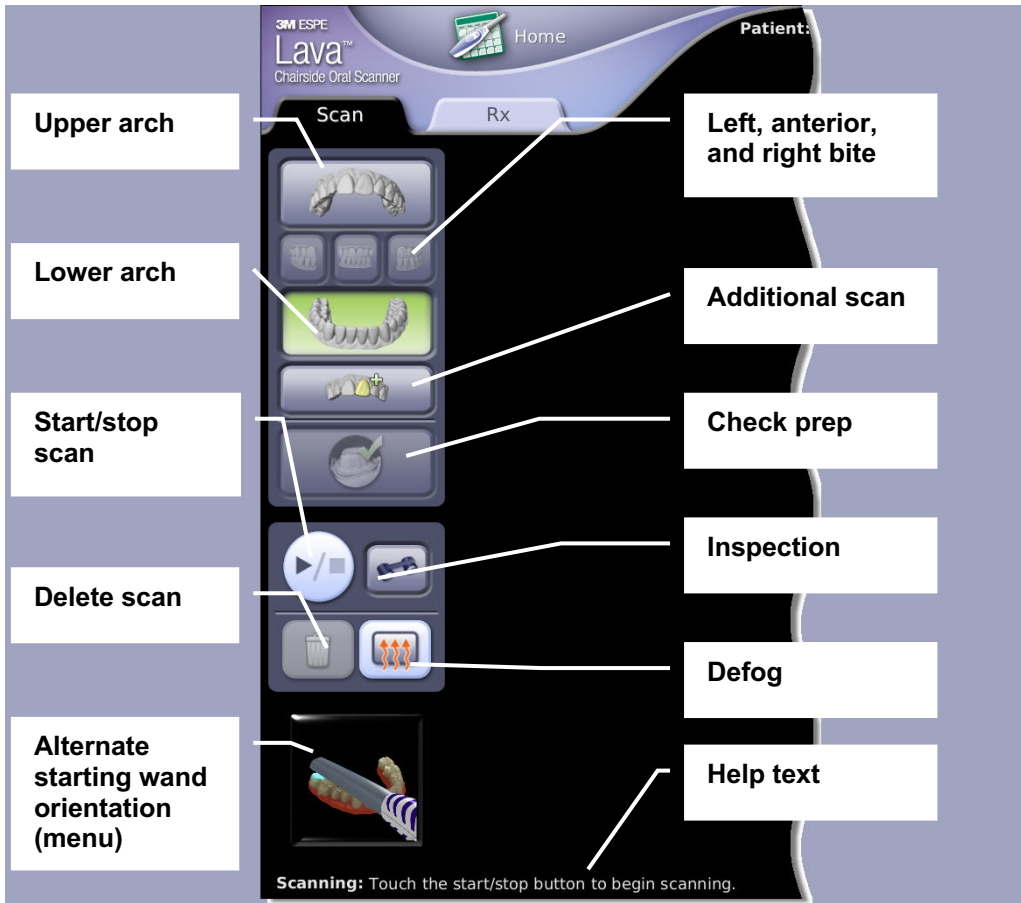
-- Patient name is placed in the Pending Patients list on the Cases in Progress tab.

Scanning



Note: This is an overview of the scanning process. For details on how to scan in a clinical setting, refer to your Lava C.O.S. training.



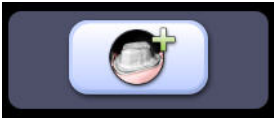


A Basic Scan

1. Select an existing case (or touch the Scan Now button for a new case) to go to the Scanning screen.







Scanning Toolbar

Icons	Purpose
	<p>Upper/lower arches – Touch one of these icons to select which arch to scan.* (After the arch has been scanned, the icon displays in color.)</p>
	<p>Left, anterior, right bites – Select which bite to scan to create a registration.* (After the bite has been scanned, the icon displays in color.)</p>





	<p>Additional scan – Make a review model to show design intent. See below for details.</p>
	<p>Check prep – This button becomes active after you accept a scan. Touch it to display a dropdown box where you add or remove preps.*</p>
	<p>Add prep – Access the Prep Selection screen, where you can identify a prepped tooth by number and on the scan. This button is available in the prep dropdown box and when reviewing a scan.</p>
	<p>Start/stop scan – Start and stop a scan by pressing this button on the screen (or on the wand).</p>
	<p>Delete scan – Delete the last scan, or all scans, in the selected arch.</p>

* Note: After you have completed a scan, you can also use these icons to display various views of the scan for review: upper or lower arch, bite scan, or still image of the prep.

Icons	Purpose
	Defog – Warm up the wand to prevent/eliminate fogging. The wand will light for up to 2.5 seconds.
	Inspection – Use the wand's camera to examine the field closely before scanning. Details below.
	Help text – Displays the name of the current screen and suggests possible actions.

2. On the toolbar select the region you want to scan—upper or lower arch.
3. Press the **Start/Stop** button  on the Scanning Toolbar (or on the wand) to start your scan.
4. When done, press the Start/Stop button again to stop scanning. The system displays your scan on the Scan Review screen.

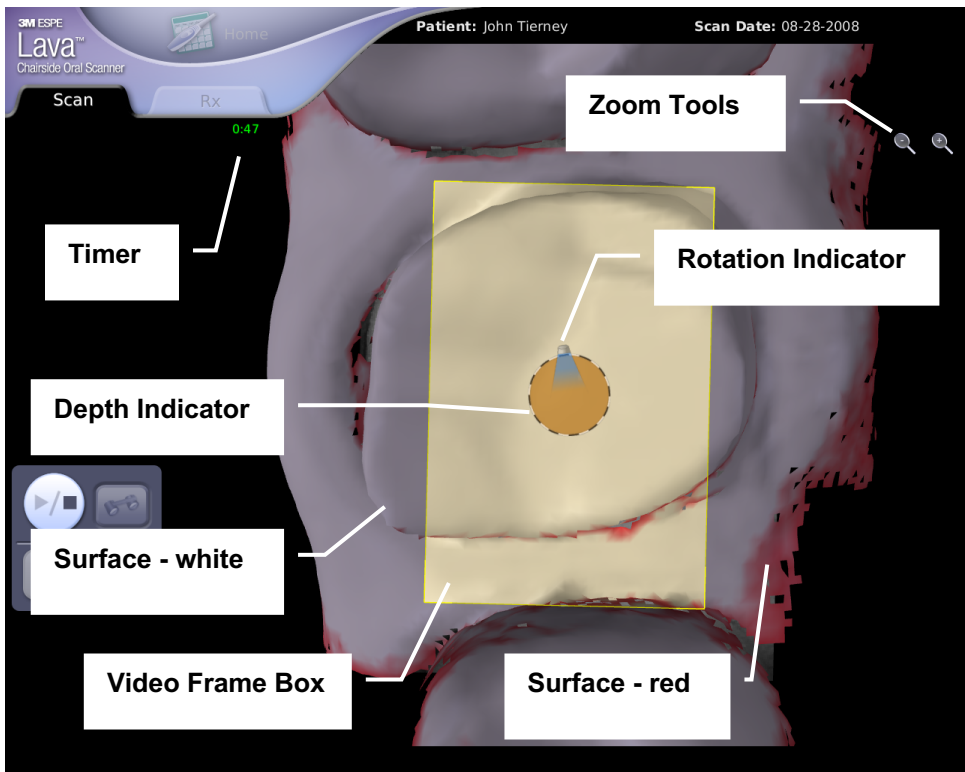
You have several options about what to do next. You can:

- Delete the scan by touching the X Mark .
- Accept the scan by touching the Check Mark . This saves the scan and prevents changes to it.
- Rewind the scan  in ten-second segments or back to the last saved scan. (See “Scan Rewind.”)
- Continue scanning to add coverage. (See “Continue Scanning and Merging Scans.”)
- Remove completion arrows, if present (See “Completion Arrows.”)
- Add a prep by touching the  button. This saves the scan and displays the Prep Selection screen. (See “Add, Review, and Approve a Prep.”)

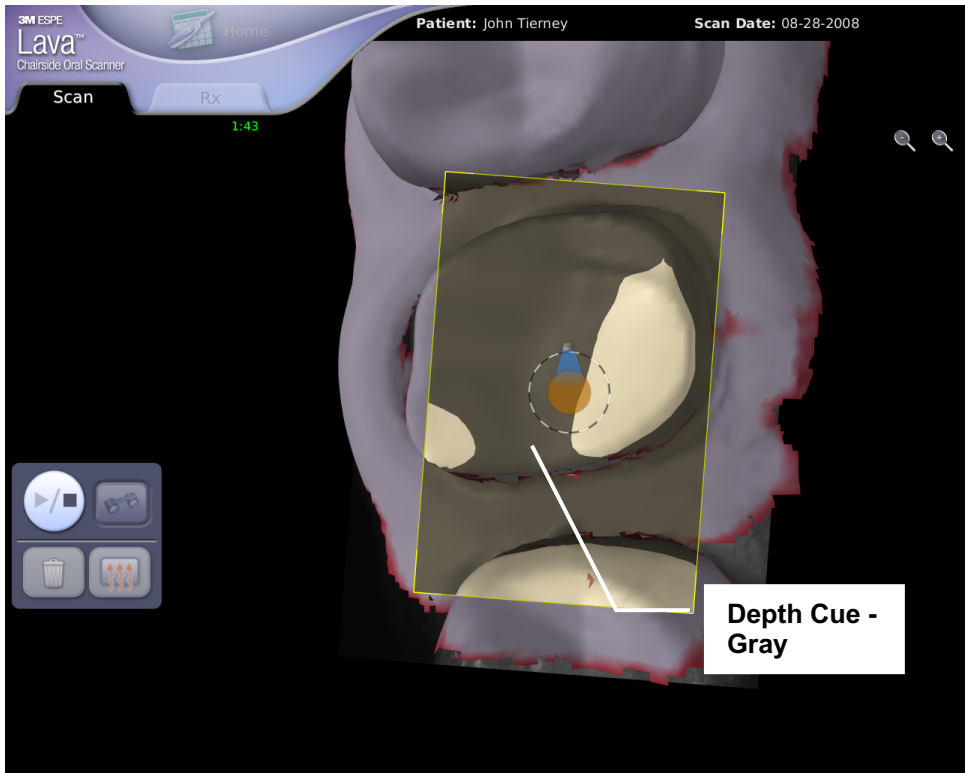
Visual Cues While Scanning

The following visualization cues are available while you are in the act of scanning:

- Video Frame Box: This box is the active area of the scanner. Surfaces within the box are being acquired. Try to keep the tooth centered in the box when scanning.
- Surfaces: Illustrates what tooth structure has been acquired. White indicates fully-acquired surfaces. Red indicates surfaces not yet fully-acquired.
- Zoom tools: Increase or decrease the size of the scan.
- Depth Indicator: Helps you determine correct depth while scanning. Ideal depth is when the size of the dynamic amber dot matches the dotted circle.
- Rotation Indicator: Displays the orientation of the wand compared to its initial, occlusal-facing orientation.
- Timer: Displays the time elapsed during a scan. See “Maximum Scanning Times,” later in this section.



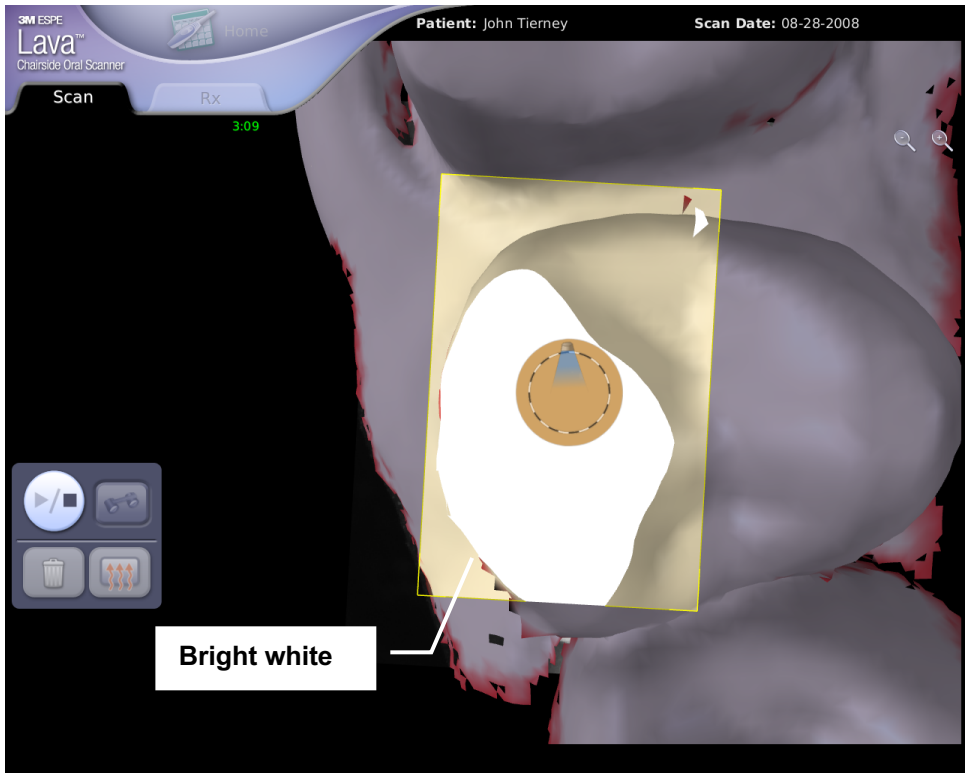
Visual Cues



Depth Cues – Gray

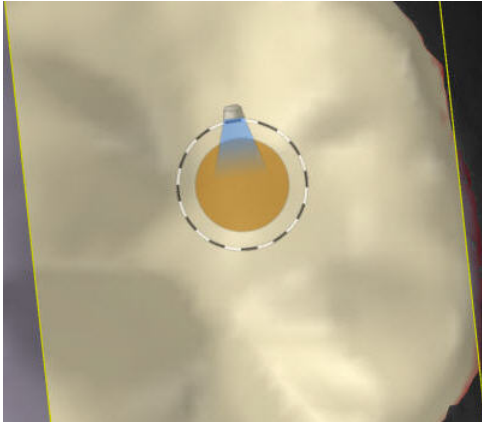
In addition to the Depth Indicator dot and circle, the Lava C.O.S. gives color cues to help you judge the distance from the scanner to the tooth.

In the example above, areas of the tooth are displayed in gray. Those areas are too far away from the scanner's lens to be acquired.

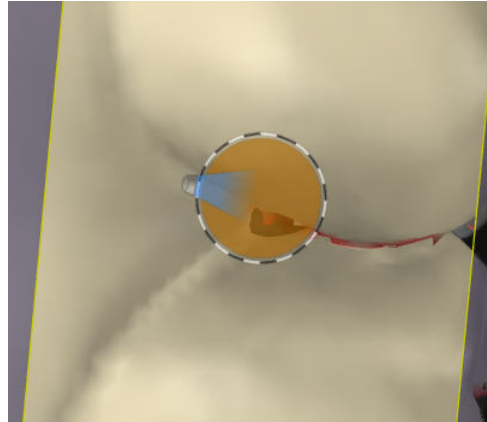


Depth Cues – Bright White

In this example, the area of the tooth displayed in bright white is too close to the lens to be captured. Note also that the dynamic yellow dot is larger than the dotted circle, another indicator that the scanning lens is too close to the tooth.



Starting Position



Rotated Position

The Rotation Indicator gives you real-time, on-screen feedback about the orientation of the wand. It is a visual cue to help you determine how the wand is rotated compared to its starting, occlusal view orientation. In the example above, the starting position is facing the occlusal surface; the rotated position is nearly 90 degrees on the buccal side.

Note: The Rotation Indicator does not display when the wand is held vertically.

For more information, refer to your Lava C.O.S. training materials.

Maximum Scanning Times

There are limits to the scanning times for a case. The Lava C.O.S. will stop a scan if:

- the current continuous scan exceeds 7 minutes
- the current continuous bite scan exceeds 2 minutes
- the total of the current case's maxillary scans exceeds 7 minutes
- the total of the current case's mandibular scans exceeds 7 minutes
- the total of the current case's bite scans exceeds 6 minutes
- the total of the current case's additional scans exceeds 4 minutes
- the total of all scans (not including bite scans) exceeds 15 minutes

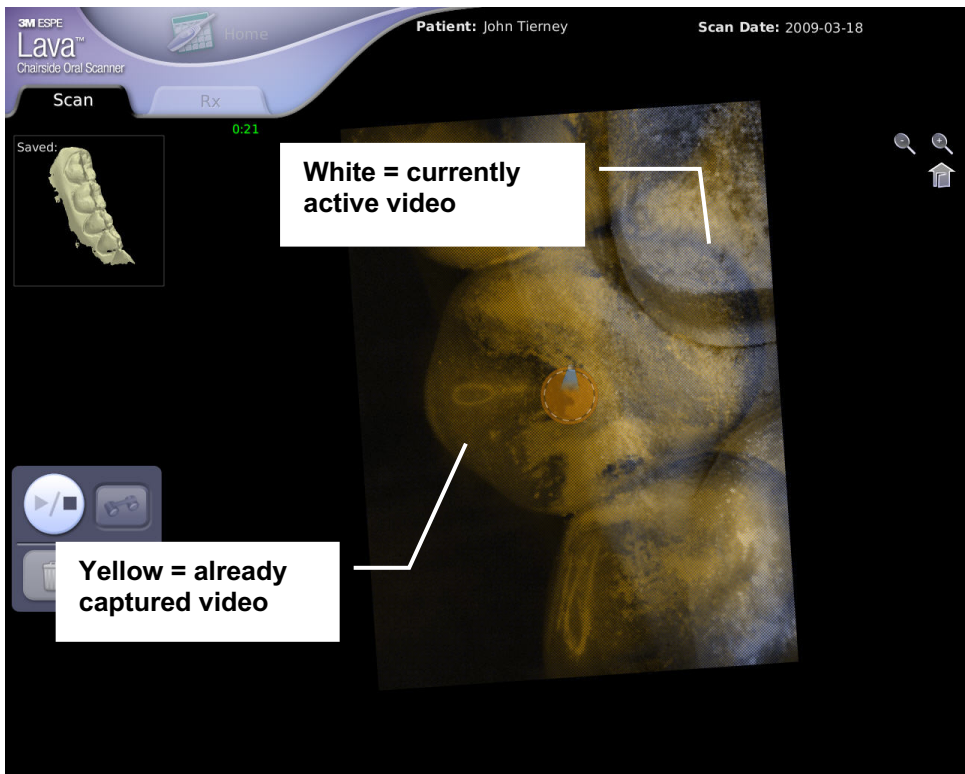
To avoid reaching these maximums, it's a good practice to delete any unnecessary or superfluous scans for a case.

Pause Mode

Some scanning practices, (e.g., moving the wand too fast, or being too close to, or too far away from, the teeth) can generate bad or inaccurate data. To safeguard against acquiring bad data, the Lava C.O.S. enters **Pause Mode**. You may also want to use pause mode when you want to take a break from scanning or if the patient needs to cough, sneeze, swallow, etc.

There are several ways to resume from pause mode:

- Return to any scanned area with your wand in approximately the same orientation it was in when you originally scanned that area.
- Backtrack to where you left off and align the live video (in white) with the static yellow image (which represents the last image of the scan captured). Find the correct depth by aligning the Depth Indicator circles. When the system matches the live video to the captured video image, you can continue the scan.
- Return to a previously scanned occlusal surface.

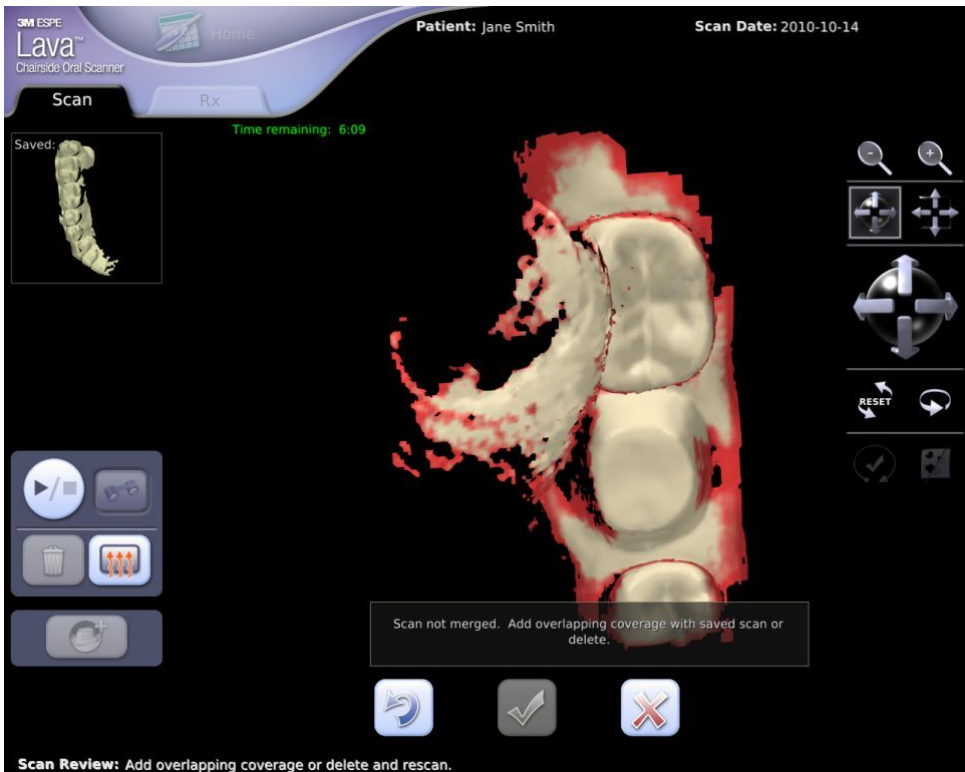


Pause mode

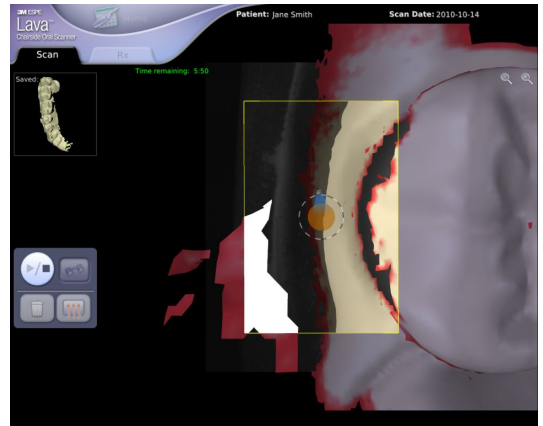
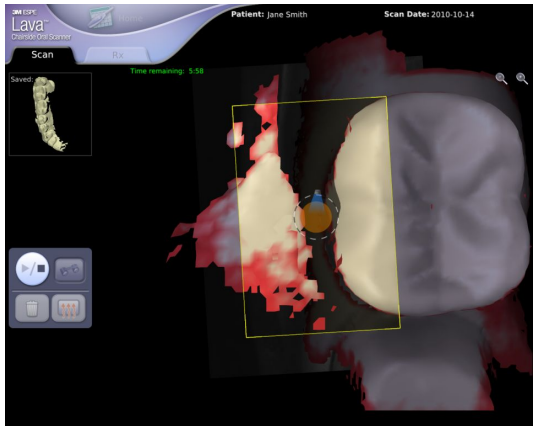
Smart Scan

Smart Scan helps you remove scanning artifacts created by moving objects and other parts of the field that have been scanned inadvertently.

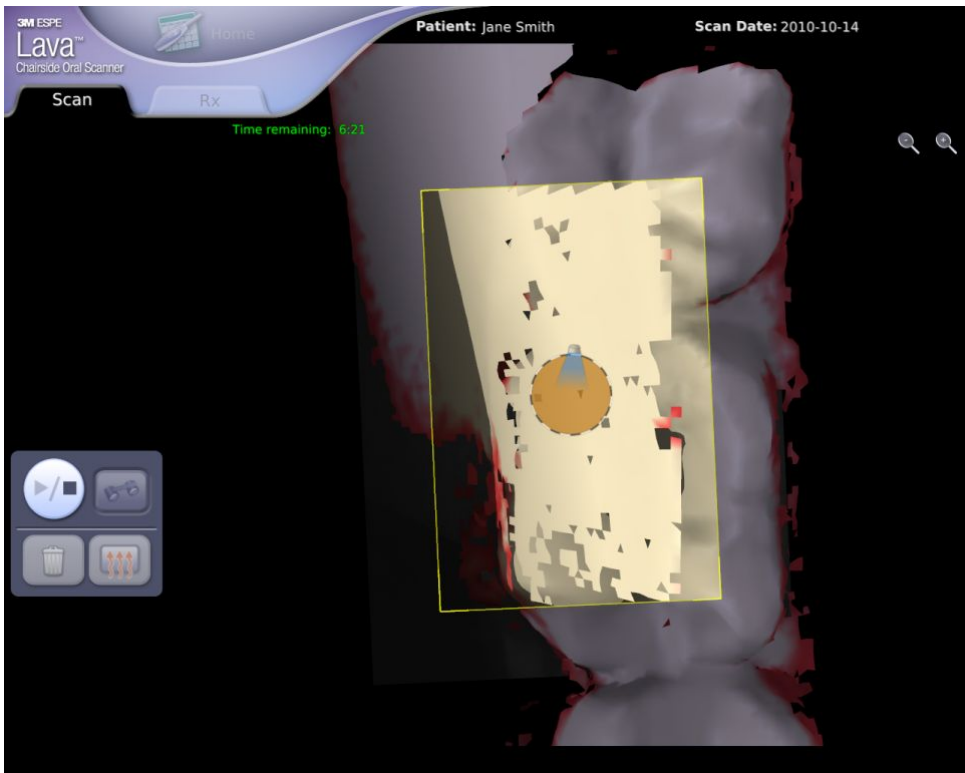
For example, when a patient’s cheek gets in the way during a scan, the Lava C.O.S. will pick up data from the cheek as part of the scan. Obviously that data is useless when it comes to making a restoration—and it may even block scan data that is needed. Smart Scan gives you the capability to remove unwanted data and scan “underneath” to the desired tooth surface.



A movable object has been scanned



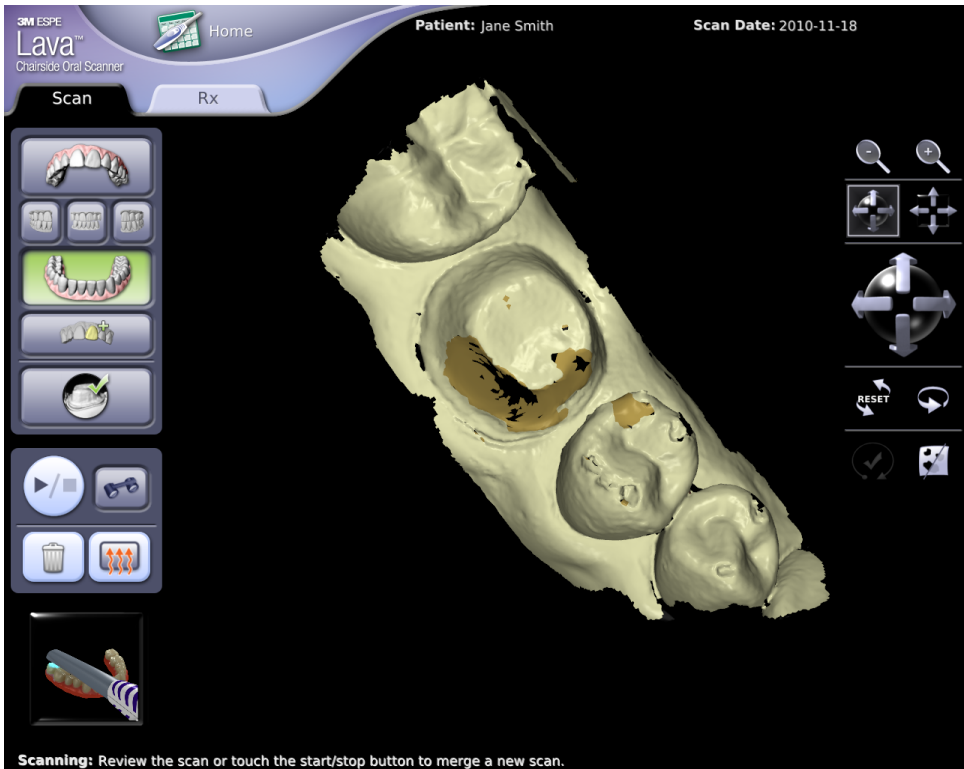
Smart Scan deletes artifacts and scans “underneath” original location



The unwanted artifacts sparkle when detected by the Lava C.O.S. 3.0

When you return to an unwanted scan area, the scan “erases” the object’s artifacts, while, at the same time, scanning the area that had originally been blocked by the object.

If you see a portion of a scan sparkling inside the yellow box, that means Smart Scan is erasing either a previously-scanned, unwanted object or a new object that has moved in to an already-scanned area.



Areas not resolved by Smart Scan will appear in *TAN*

Please note that some objects will be resistant to Smart Scan, so it may still be necessary to delete the scan and start over.

Reviewing the Scan

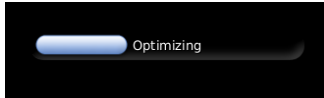
Scan Review mode enables you to:

- Review your scan for coverage
- Rewind to previous points in your scan
- Fill holes quickly
- Make sure the scan is complete
- Accept (or reject) scan merges and registrations
- Access the Prep Selection screen, if you're adding a prep







Scan Review

The Lava C.O.S. displays the Scan Review screen when you stop a scan by pressing the Start/Stop button to stop a scan. It also processes the scan, whose progress is displayed in the lower right side of the screen:



Note: You do not have to wait for the progress bar to complete before accepting or rejecting a scan. As soon as the check and X buttons become active, you can accept or reject the scan.


You exit Scan Review mode, essentially, when you've made a decision about the scan. You can either:

- Accept  the scan,
- Reject  the scan, or
- Access the Prep Selection screen  to add a prep
- Or, you can rewind the scan , explained below.

Scan Rewind



Scan Rewind dialog box

The Scan Rewind feature gives you the option of “rewinding” your scan by going back in time—in terms of the scan—in ten-second segments. Just press the Scan Rewind icon  to display the Scan Rewind dialog box.

Choose whether to rewind ten seconds or all the way back to your last saved scan, i.e., the last time you pressed the green check mark.

Adding a Prep

Before sending a case to the lab, you must review images of the prep to ensure there is a clear, unobstructed view of the margin. It is a required step in the scanning process and must be completed before you can sign a prescription. See “Add, Review, and Approve a Prep.”

Scan Review and Changing the Field

Important Note: You *cannot* change the field or repowder when you are in Scan Review mode. That will distort your current scan. If changes to the field are required, you must accept or delete the current scan first, before you make changes to the field. Then continue scanning. Here's an easy way to remember this rule: ***If the wand is flashing, you cannot change the field in any way.***

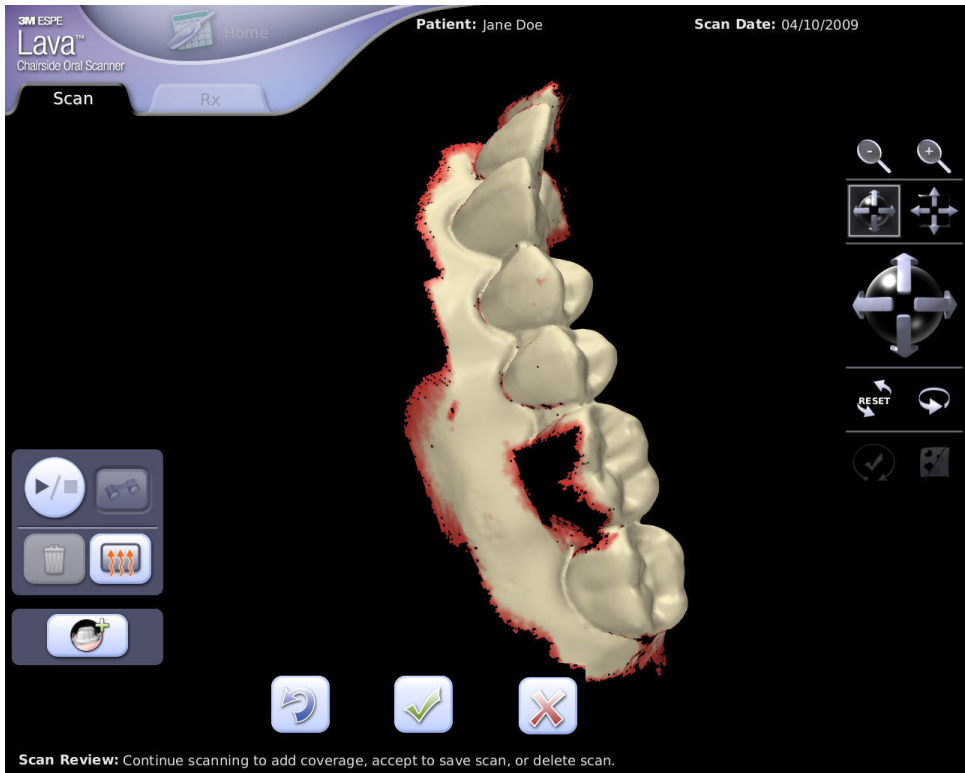
Continue Scanning and Merging Scanning

To *continue* a scan means to return to scanning after you have pressed the Start/Stop button. Typically this is done to capture more coverage, fill holes in a scan, or complete the scan path.

Merging scans is the combination of two or more separate scans by the Lava C.O.S. The system merges scans automatically.

Continue Scanning

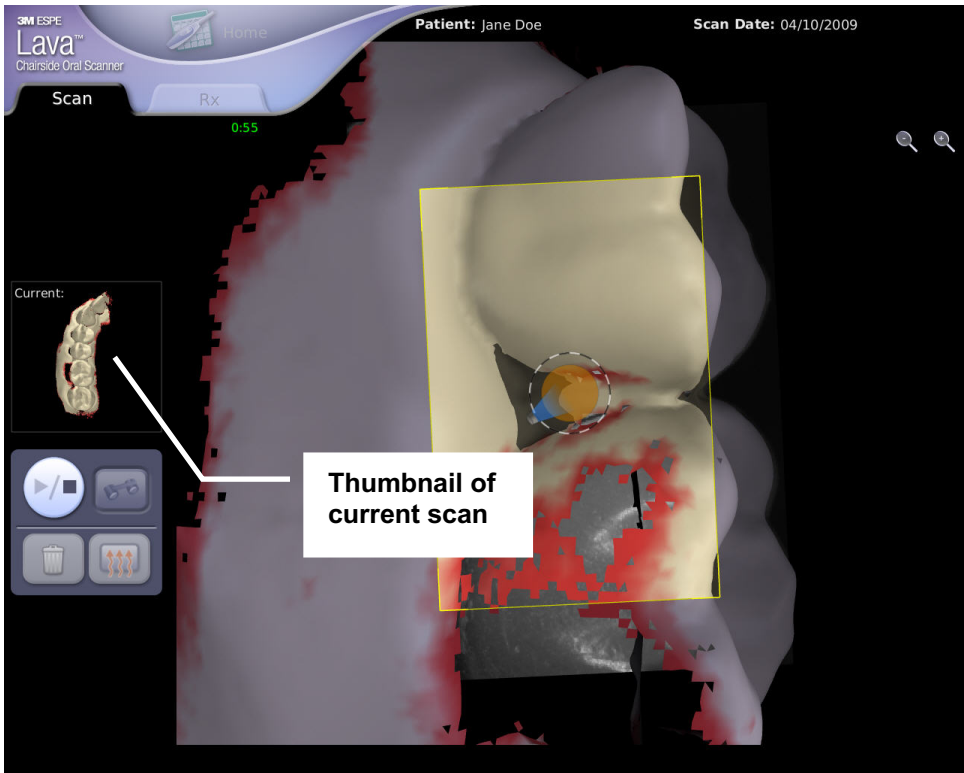
In this example, after an initial scan is stopped (with the Start/Stop button), a hole becomes apparent when the scan is rotated.



First scan showing hole

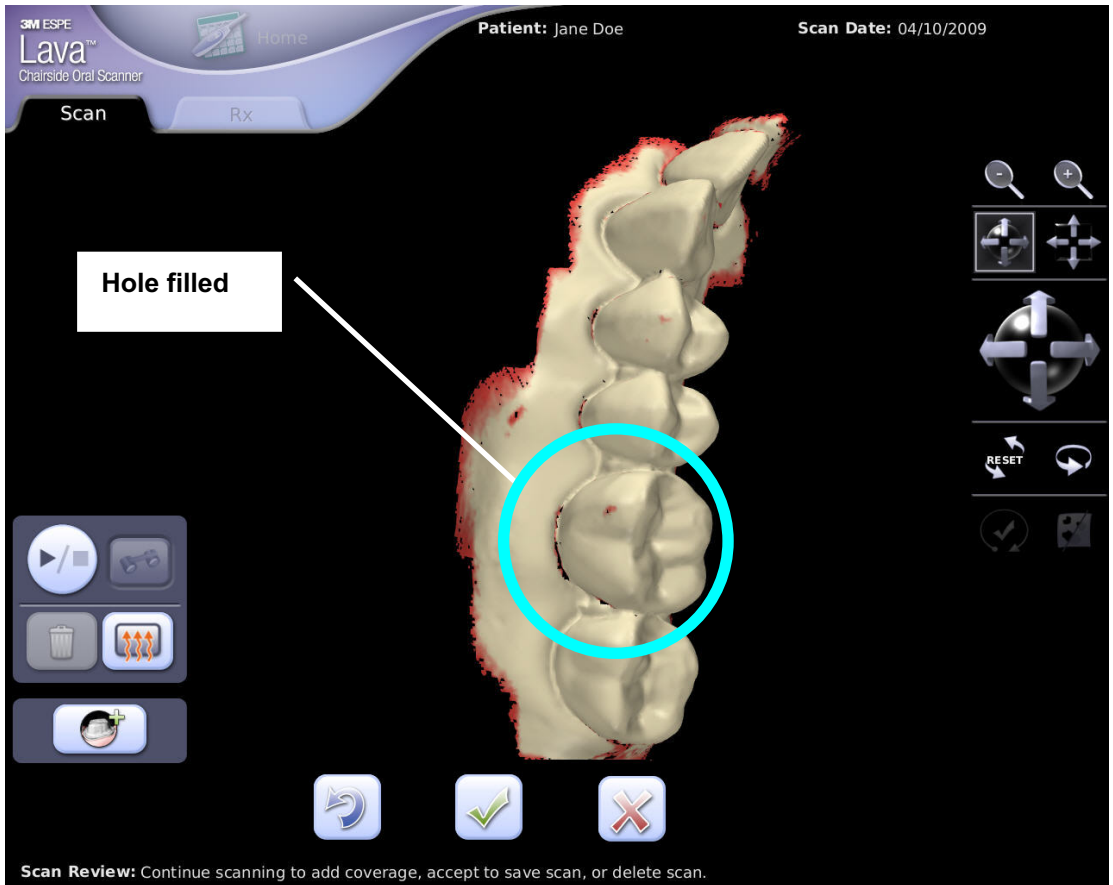
To fill the hole, *continue* the scan, focusing on the area not previously captured. When continuing a scan, your approach with the wand is similar to resuming from Pause Mode. See “Pause Mode” for details.

While scanning, the screen will display a thumbnail, a reduced version of the current scan, on the left side of the screen. The thumbnail is labelled, “Current.” It can be useful as a guide as you continue scanning.






Continue scanning: current scan displayed

When the scan is stopped again, the Lava C.O.S. adds the newly-captured scan data to the previous scan data. This happens each time you continue and then stop a scan by pressing the Start/Stop button.




Continue scanning: hole filled

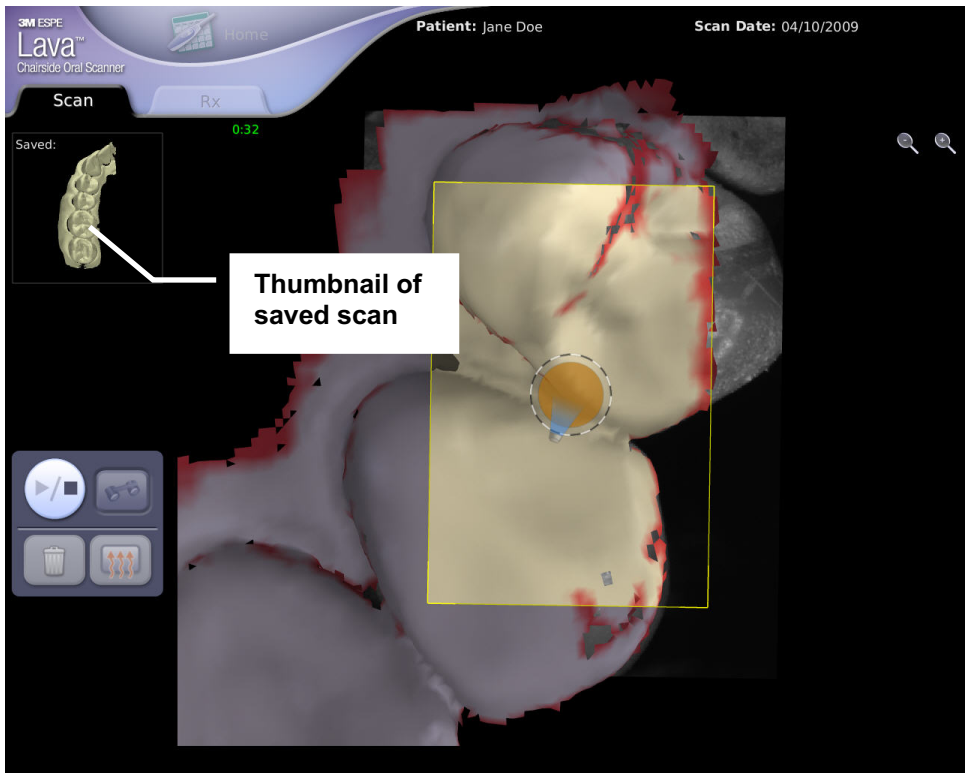
The hole is now filled. Note that each continued scan in this process took place without leaving the Scan Review interface.

At this point in a typical workflow you would press the (check)  button, if the scan is acceptable, to save it; press the (reject)  button if it's unacceptable, and try another scan; or press the Add Prep  button to add a prep (see below).

Merging

When you save a scan by pressing the  button, it becomes a separate scan. At this point, it cannot be changed. But it can be deleted, and it can be *merged* with other scans.

In the example below, the opposing arch has been scanned and saved, becoming a separate scan. When the rest of the arch is scanned, the first saved scan is shown in a thumbnail labelled “Saved” on the upper left side of the screen.

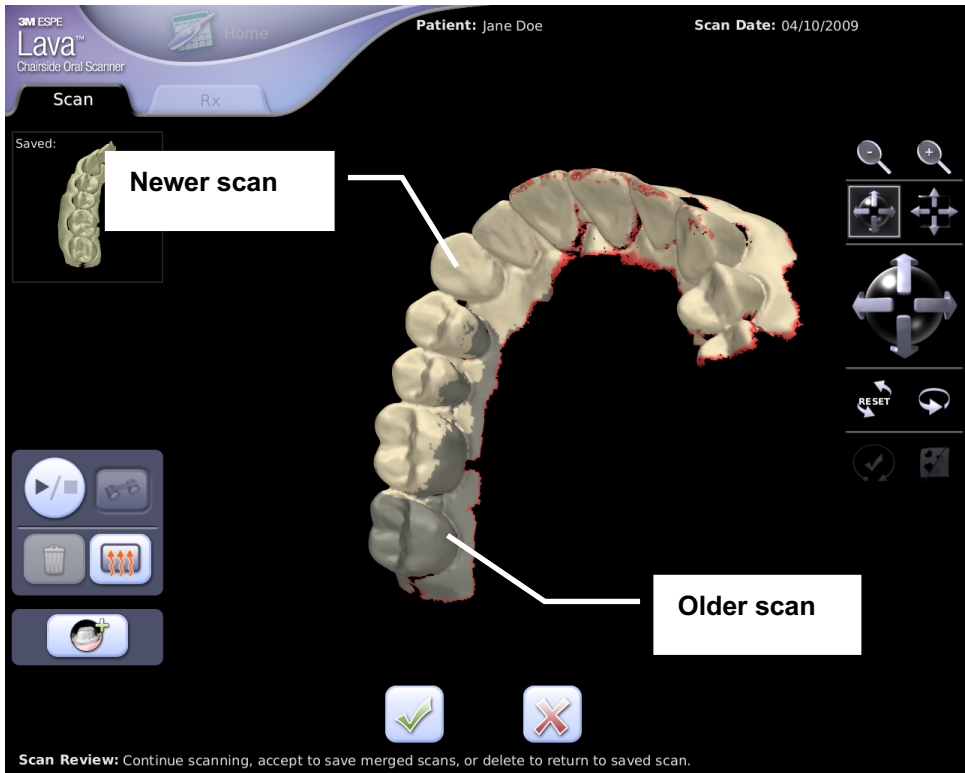


Merge Scanning: second scan



Note: While scanning, you will need to overlap the saved scan to achieve a successful merge of the two scans.

When you stop the scan next time, the system automatically merges the two separate scans.

The color for the older scan is gray; the color for the newer scan is white (and red around the edges). This continues for each successive scan.

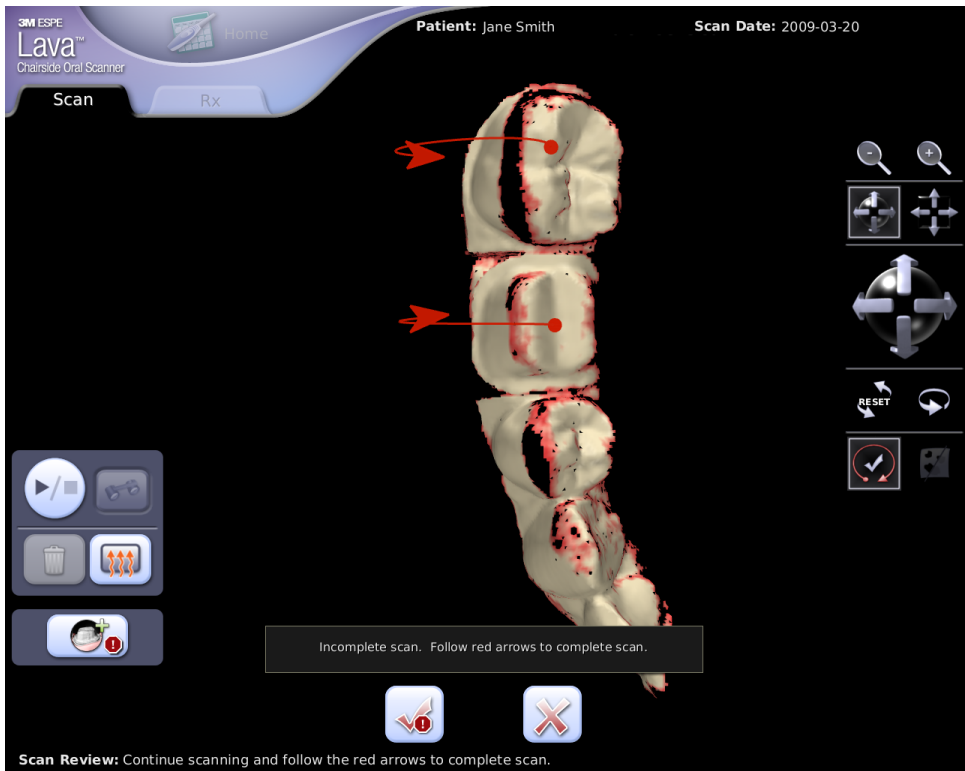


Merged scans

When you stop scanning, press the (check)  button if the merged scan is acceptable and you want to save it. Press the (reject)  button if it's unacceptable, then try another scan.

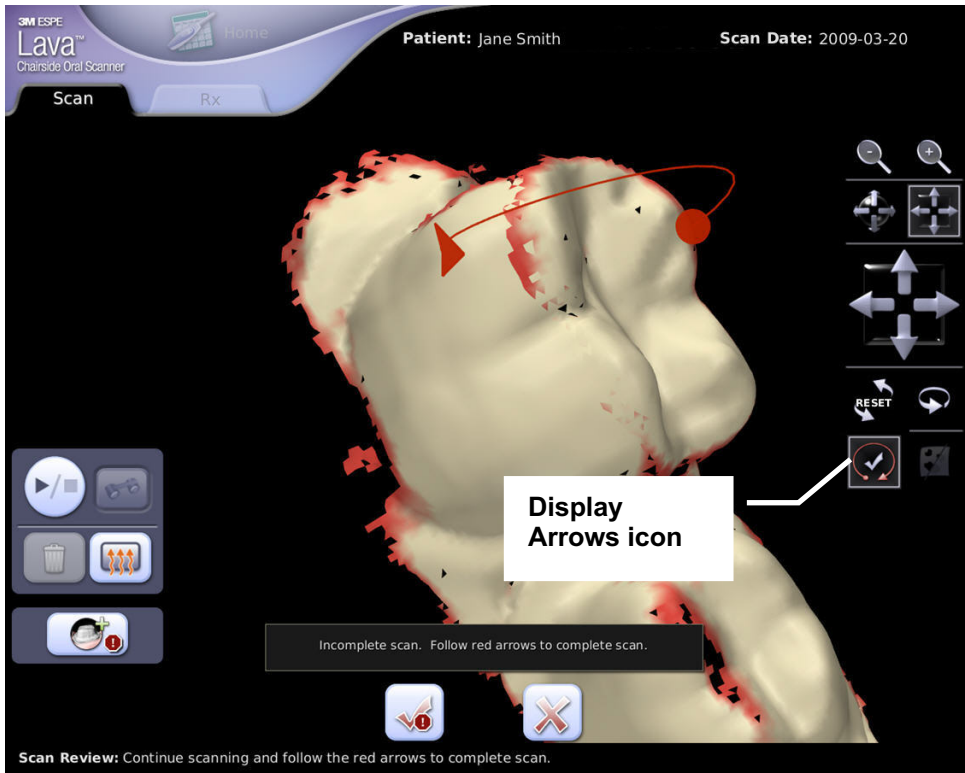
Completion Arrows

The Lava C.O.S. has a tool to help you evaluate your scan quality. The Completion Arrows feature lets you know right away—before the case is sent to the lab—whether you have followed the scan path with enough accuracy to proceed. If the scan path needs correction, this tool shows you where to fix it.



Completion Arrows

To improve your scan and remove the completion arrows, resume scanning in the area of the arrow from the lingual to facial surface. The next time you review that scan, the arrow should be gone.



Completion Arrow: closer view

If a scan has multiple arrows, you do not need to perform a separate scan for each one. It's easier to fix each arrow, one at a time, during a single scan. If you encounter a cluster of arrows, starting your scan in the center of the cluster will often fix the arrows.

If a scan has arrows that cannot be fixed, or if trying to fix arrows leads to yet more arrows, it is recommended that you delete the scan and start again.



Note: You may decide to send your scan to the lab even with the red arrows. However, this may result in an inaccurate SLA model and, therefore, an inaccurate restoration.



The Display Arrows icon toggles the display of completion arrows on or off. This button is available only when the arrows are present. If an accepted scan has arrows, use this button to display or hide them. You cannot, however, fix the arrows on an accepted scan. Rather, you would have to start the scan over again.


Add, Review, and Approve a Prep

When a case is sent to a lab, the data includes high contrast black-and-white images of the scan, including the prep. You must review the images of your prep to ensure there is a clear, unobstructed view of the margin. This is as important as reviewing the onscreen scan for proper coverage.

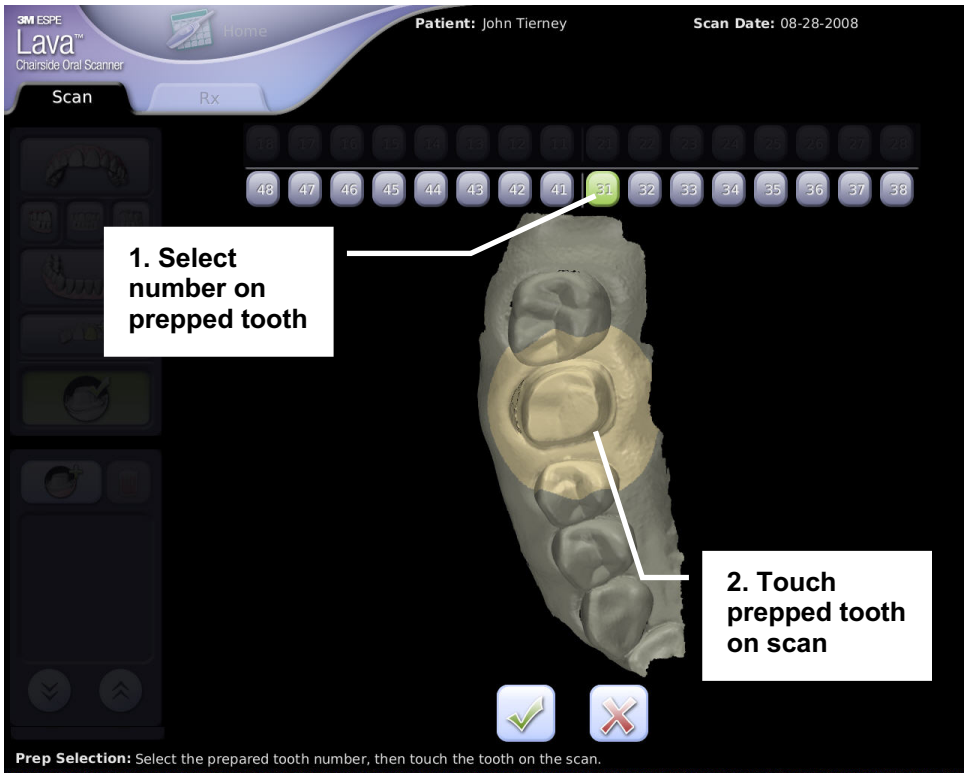
Note: This is a required step in the scanning process. It must be completed before you can sign a prescription.

After you have scanned the prep and two-thirds of each adjacent tooth (refer to your Lava C.O.S. training for details), add the prepped tooth:





1. Select the Add Prep button , which becomes available at the bottom of the Scan Review screen toolbar after you stop a scan. Selecting it takes you directly to the Prep Selection screen.
2. Select the number of the prepped tooth, then touch the prepped tooth on the scan. The system highlights the prep and the area around it.

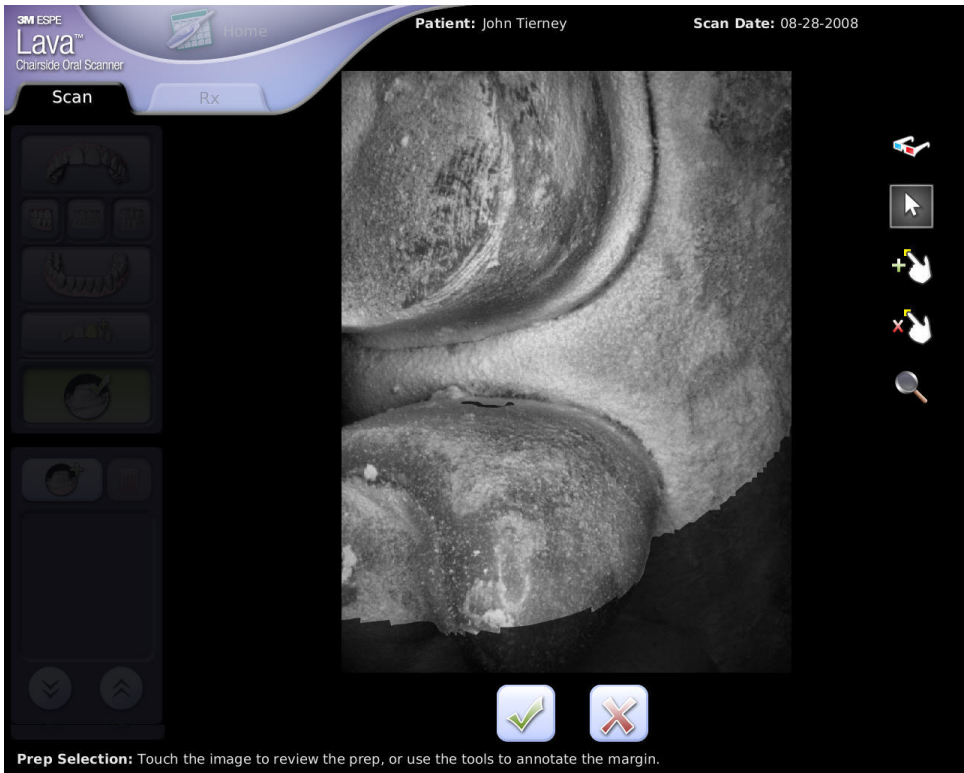
Note: For multiple prep cases, repeat these steps for each prep. See “Multiple Preps” at the end of this topic.



Select prep number; touch prep on scan

- To review both the scan and the detailed still images of the prepped tooth, press the Check  button. (Or cancel your selection and return to the previous screen by pressing  .)

The system zooms in on a still image of the selected tooth, taken from the video footage of the scan.



Close-up video image of the prep

To get more views, touch the prep at the location where you want the close-up view. The system zooms to the best view of that location.

You can also drag your finger on the screen to rotate the scan, and then tap again for the close-up image.

The scan rotates about the last point selected. To view different areas or angles, select a different point and rotate again.



Selected area of the prep – scan view

For example, if you tap a spot inside the highlighted area on the scan, as shown by the arrow above, the system will zoom in to a close-up video still image of that spot. See next page.



Close-up of the prep – still image view

You can tap along the margin of the prep, for example, to see a series of close-up views of the margin. Viewing the close-up images in this fashion is perhaps the most important assessment tool you will use.

For a three-dimensional look at the still image of the prep, select the Stereo glasses icon. The system switches to stereo mode. You will need to wear red/blue stereo glasses to perceive the 3D image. See the following page.



Stereo image mode

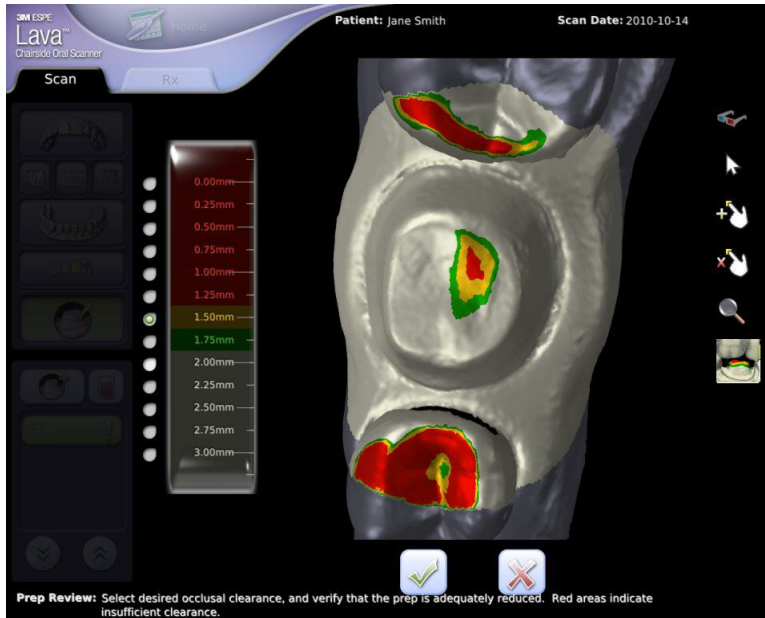
Note: You can also magnify the image even further and add points to identify for the lab where the margin is. See “Margin Annotation” below.

Occlusal Reduction Tool



After you have completed the operative, opposing and bite scans (see “Bite Scan” below) and entered Margin Review, the Occlusal Reduction Tool allows you to see whether the prep has been reduced adequately. This tool color codes the distances between surfaces so you can quickly identify areas that are closer to the occlusal surface of the opposing tooth than what is required for your chosen restoration.


You can select a range of between 0 and 3.0 millimeters for the system to measure and label.

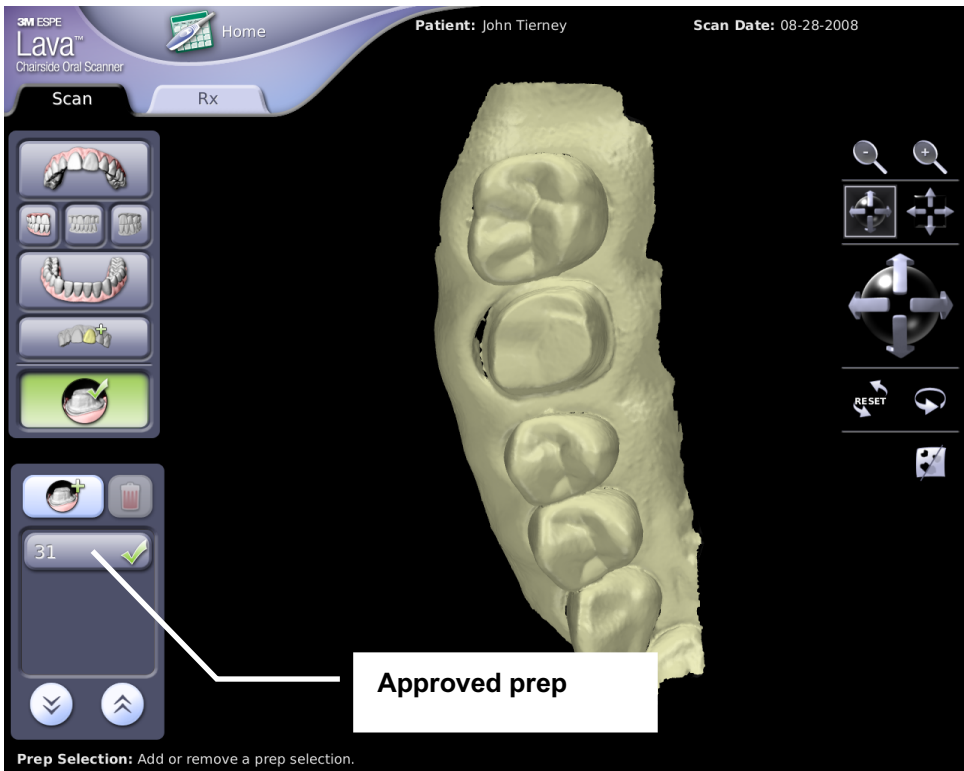


Occlusal Reduction Tool

In this example, the acceptable occlusal distance is 1.75mm. Areas at that distance are highlighted in green. Areas at 1.5mm are in yellow, and all areas with 1.25mm clearance or less—identified by the doctor as being at an insufficient clearance—are highlighted in red. The prep may require additional reduction of its red area to achieve an acceptable occlusal fit.

Please note that, for the Occlusal Reduction Tool to be effective, the bite scan should always include your prepared tooth or teeth.

4. Finally, after making sure the scan offers a clear, unobstructed view of the margin—and after deciding you are satisfied in general with your scan of the prep—press the **Check**  button.




Approved prep

The prepped tooth is added to a dropdown toolbar and marked with a green check mark.

Multiple Preps

You use the dropdown toolbar if you are making multiple preps instead of single preps, although the procedure is slightly different:


1. From the Scanning screen, select the Check Prep  button on the top toolbar. The dropdown toolbar is displayed.

2. Select the Add prep button  to access the Prep Selection screen.
3. Proceed as you would with adding a single prep.

You can also review the close-up images of preps by selecting the numbered prep on the toolbar.

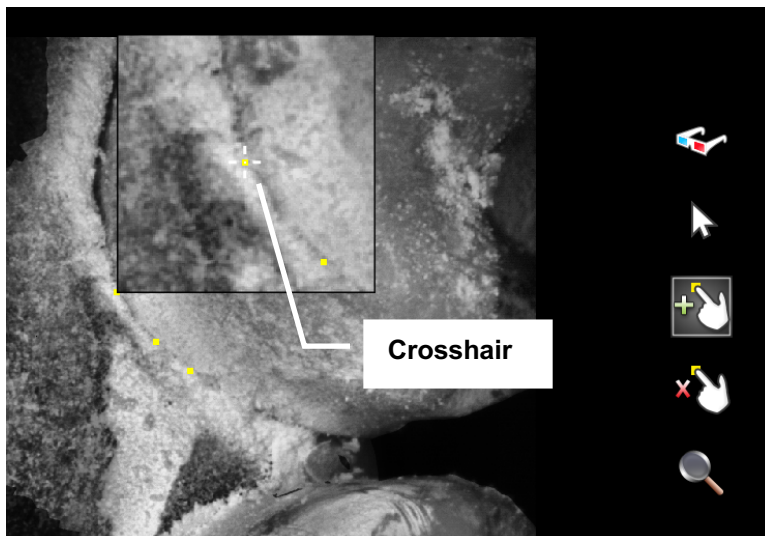
Margin Annotation Feature

If you know where the margin is but you suspect the lab may find it ambiguous, use this feature to clarify the location of the margin. It's similar to the practice of redlining a self-trimmed die in the conventional impression process.

1. On the Review Prep video still screen, press the add  icon, then touch and hold your finger on the prep on the margin in the area of ambiguity.

A square window opens magnifying the area under your finger. The crosshair in the magnifying window indicates the location of your finger.

2. Roll your finger on the screen so the crosshair is over the magnified edge of the margin.





3. Move the crosshair to the spot on the margin you want to mark.
4. Remove your finger to place a yellow dot at the crosshair.

5. Add more margin-marking dots as necessary.


6. When done, touch the  button on the bottom of the screen.

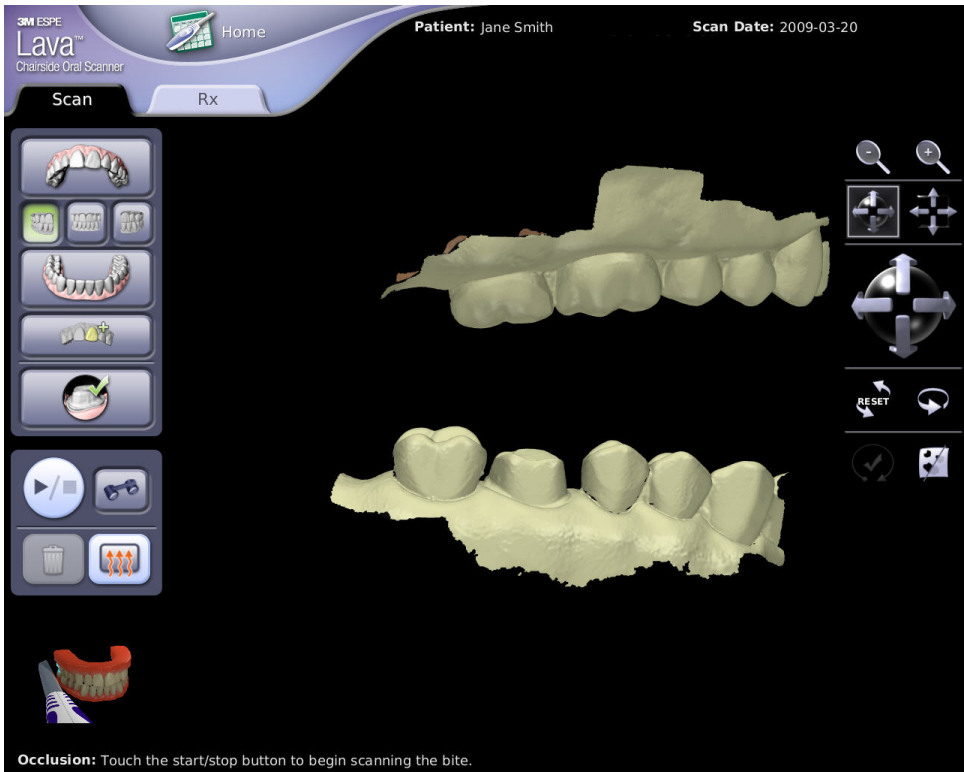
The dots along the margin are included in the case information uploaded to the lab.

- To remove margin-marking dots, touch the remove icon , then touch the yellow dot to be removed.
- To review the area with the magnifying square and not place dots on the image, touch the magnify icon .

Bite Scan

The bite is generally scanned last, after you have identified and approved the prep, and after all other scan types have been performed.

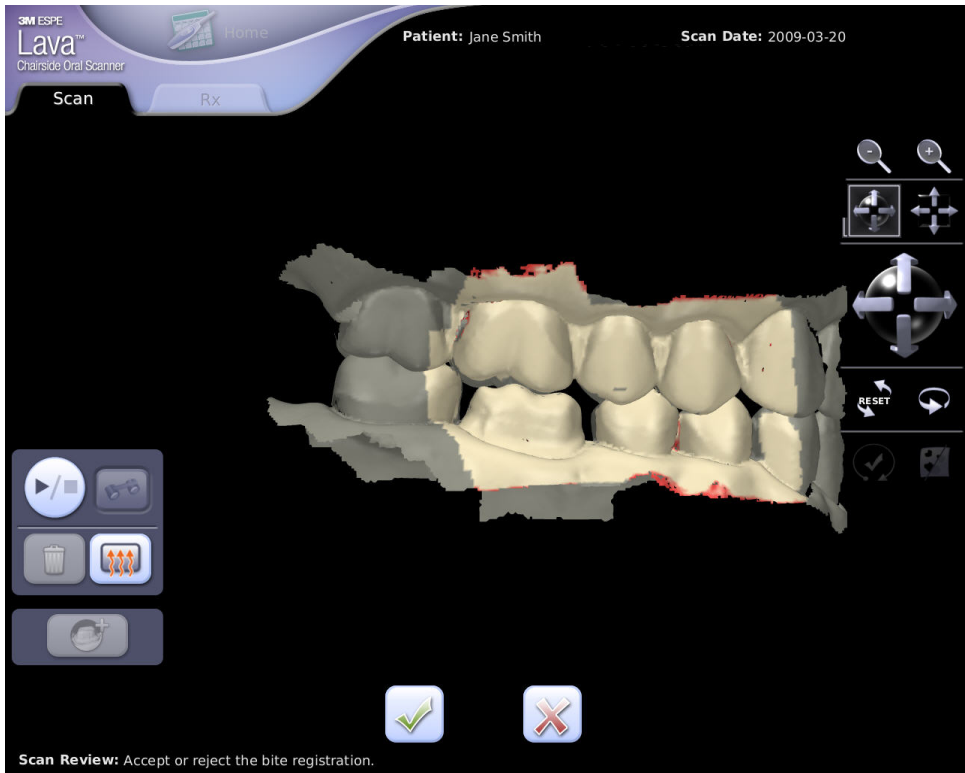
1. Select one of the bite icons, left, anterior or right  on the upper toolbar. The system will display the two arches already scanned.





Scanned arches

2. Scan the bite.

When you're done, the system will merge the upper, lower and bite scan scans into proper registration.



System-generated bite registration

1. Accept or reject the registration by selecting the Accept  or Reject  button.



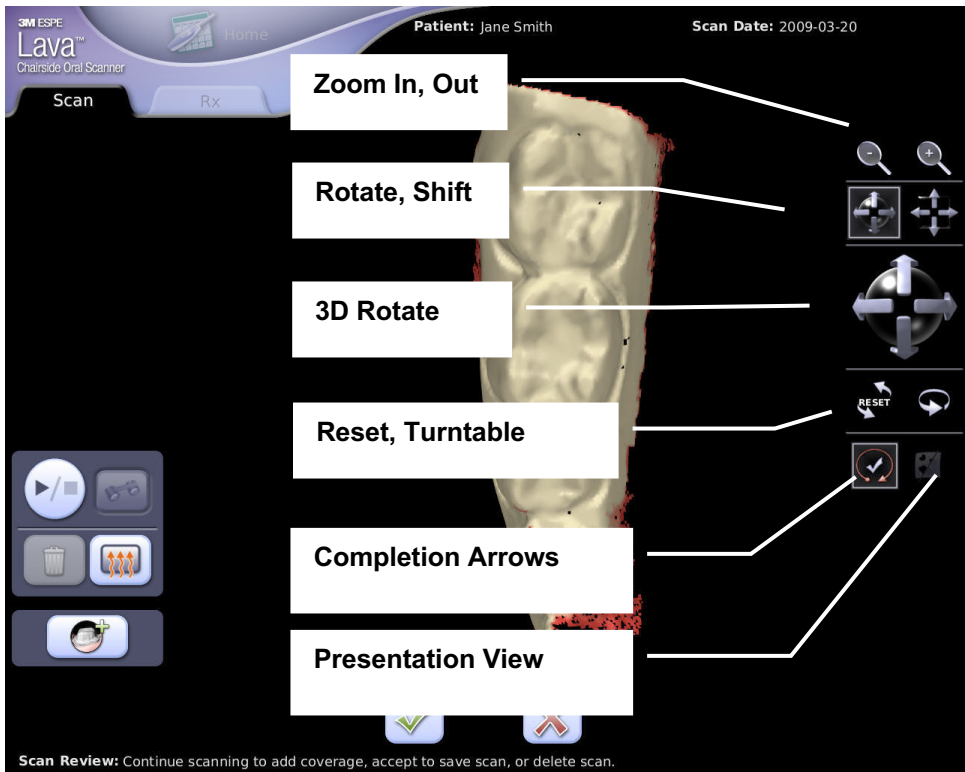
Accepted bite registration

2. When you're done scanning, you can proceed to the Prescription screen for this case by pressing the Prescription tab.

If the registration fails, try to add coverage to the bite scan. If it fails again, you can still choose to accept the bite scan. In such a case, the unregistered bite is sent to the lab with a “warning badge” and the lab will need to articulate the bite manually.

Scanning and Reviewing Tools and Features

This section describes the various tools and features that will help you with scanning



Scan Review tools

To manipulate the view of a scan, drag your finger on the screen. You also have these viewing tools:

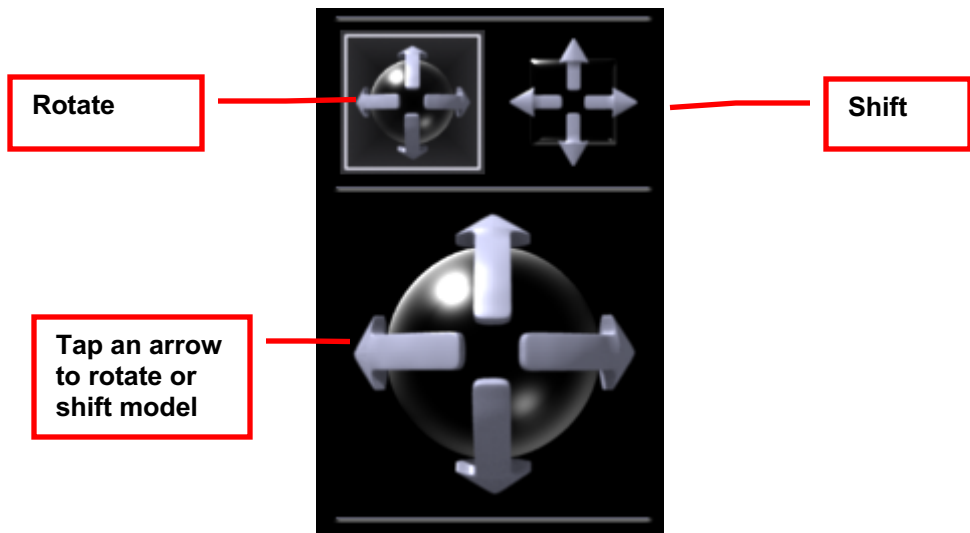
- Zoom In/Out– Increase or decrease the size of the scan image.
- 3D Rotate – Spin the scan about the center point.
- Shift – Move the scan left or right, up or down without changing its angle or orientation.
- Reset – Return to the initial view of the scan.
- Turntable – Auto-rotate the scan about the center point.
- Completion Arrows – Indicate an incomplete scan. See “Completion Arrows.”
- Presentation View – Fill in holes for presenting the scan to the patient.

Shift and 3D Rotate: Drag or Tap

When reviewing the scan, you can change between rotating the scan in 3D and shifting the scan by selecting the Shift or Rotate icon.

Then there are two ways to shift or rotate the scan:

- Drag your finger on the touchscreen
- Tap the arrows of the Shift and Rotate icons.



The Lava C.O.S. defaults to rotation, but the tap feature also works for shifting the scan one tap at a time. Tap the up, down, left and right arrows of the icon to move the scan incrementally.

Maxillary Flip


Maxillary Flip makes sure the motion of the wand in your hand is congruent with what you see on the touchscreen. So if you move the wand left to right, the image on the screen should also move left to right. This feature is designed to make scanning the maxillary, specifically the upper anterior, easier and more intuitive.

When you scan the upper anterior and rotate the wand severely from its original position, the Lava C.O.S. detects a mismatch in the orientation of the wand and the on-screen image and

automatically flips its screen orientation. The direction of the wand and the direction of the on-screen image thereby become consistent.

Pause Mode When Flipped

If you enter pause mode when the Maxillary Flip feature is active and you experience difficulty recovering from pause mode, follow these instructions:

1. The image will be aligned to the spot where you entered pause mode, so try to recover from your original location.
2. If that doesn't work after a few seconds, return to an occlusal surface you have previously scanned.
3. If the paused image looks incompatible with the live image, press the Home Base icon. . That will “un-flip” the live image and make it consistent once again with the motion of the wand.

Notes:

- When Maxillary Flip is active, the Select button on the wand itself will also activate the Home Base icon.
- When Maxillary Flip is NOT active, there is little effect on the image when you press the Home Base icon.

Inspection



You can use the wand's camera to examine the field closely on the touch screen. It's similar to using an intra-oral video camera.

1. Select the appropriate arch.
2. Select the Inspection scan icon on the Scanning screen's toolbar.
3. Press the Start/Stop button to start the wand and inspect the area.

When you press the Start/Stop button again, the playback is displayed automatically. You can review the video (see the illustration below) or you can press the Start/Stop button on the wand to proceed directly to scanning. **Note:** The video captured is for review only and cannot be saved.



Inspection video

Inspection Mirror



While inspecting, the Lava C.O.S. will automatically default to an appropriate mirror mode: on for the upper arch, off for the lower arch. You can switch between mirror modes by touching this icon.

The Additional Scan Feature



You may want to add more than one scan to the case information you send to the dental laboratory. For example, you may want to make a reference model with the temporary in place to show design intent, as you might do in the traditional impression process. The scan will be printed and included in the model kit for the lab.

To make an additional scan:

1. Select the Additional Scan icon on the Scanning toolbar.
2. Identify the location of the scan by touching either the maxillary or mandibular icon that appears.




3. Perform the scan.
4. When done, approve the scan as you would any other scan.

This scan is automatically added to the patient's case data to be uploaded to the lab.

Notes:

- It is not the purpose of this feature to add extra scans of the prep. Labs are not able to use this additional scan to identify the margin.
- You can create only one additional maxillary or mandibular scan per case.
- You can make an additional scan at any point in the scanning process; it does not have to take place either before or after any other type of scan.

Deleting Scans

If you need to delete a scan, select the Trash Can  icon. The system displays a message asking you to confirm the deletion. Select whether you want to delete the last scan or all scans of the current type, for example, all maxillary scans.

Alternate Starting Wand Orientation


When scanning an arch, you are not limited to starting your scan on an occlusal surface. For example, if you're scanning anterior teeth on the mandibular arch, you will likely find it easier to start the scan with the lens of the wand facing the facial surface. Since the default selection is facing the occlusal surface of the mandibular arch parallel to the midline, you might select one of these alternate wand orientations:



Alternate Starting Wand Orientation Menu

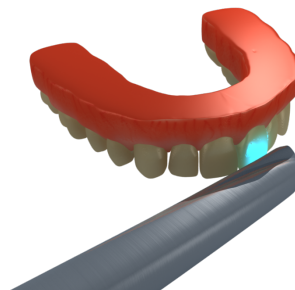
A similar menu of wand orientations is available for scanning the maxillary arch and anterior bite.

Note: Alternate starting wand orientations apply only to the beginning of each scan, not continued scans. If you are continuing a scan, resume scanning the area with the same wand orientation used for the original scan.

To display the menu, touch the Wand Orientation button  at the bottom of the toolbar on the Scanning screen. The current wand orientation is displayed until you start scanning.

Wand Orientation vs. Wand Position

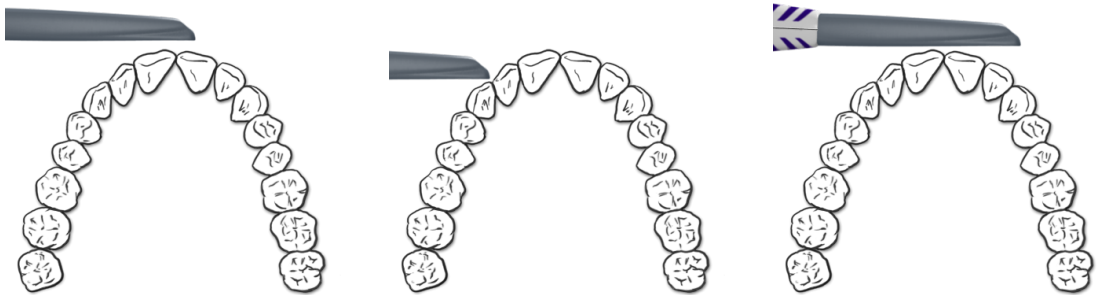
Please note that the alternate wand thumbnails illustrate the *orientation* of the wand, not its *position*. For example, here is a wand orientation available for the maxillary arch:



Alternate wand orientation

As you can see, the orientation of the wand is perpendicular to the midline, facing the facial surface of the tooth. If you select this option, therefore, the starting orientation of your wand should likewise be perpendicular to the midline and facing the facial surface of a tooth. But its *position* can be different. In other words, the wand can be facing another tooth; it does not have to be the one illustrated on the menu.

The starting positions below would be acceptable, because their orientations are the same as the one selected:



Acceptable alternate starting positions

The following positions would be unacceptable for this example, however, because the orientations are not perpendicular to the midline:



Unacceptable alternate starting positions

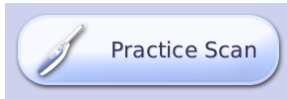
Wand Cursor



You can move through the onscreen selection areas using the left and right arrows on the wand's keypad. For example, if you are on the Scan Review screen, you can use this feature to save or delete a scan without having to lean over the patient to touch the screen.

Press the Select button on the wand to display the cursor. Use the left/right arrow buttons to move the cursor (the green hand) over your choice, then press the Select button on your wand to make your selection.

Practice Scanning



You can practice scanning without having to save the scan.

To practice a scan, press the **Practice Scan** button on the Home screen. That displays the Scan screen.

A practice scan works the same way a normal scan does. You can practice a scan and then review the resulting scan. There is no prescription to fill out when scanning is done. And, when you leave the Practice Scan screen, all scans are deleted.

Important note: You cannot save a practice scan or send it to your lab.

Filling Out the Electronic Prescription

Note: You can fill out a prescription at any time, but before you can **sign** a prescription, you must complete all three required scans for a case (operative, opposing and bite) and select at least one prep.

To fill out an electronic prescription:

1. Select the case for which you want to fill out a prescription. (If the system displays the Scan and Review screen instead of the Prescription screen, touch the Prescription tab.)

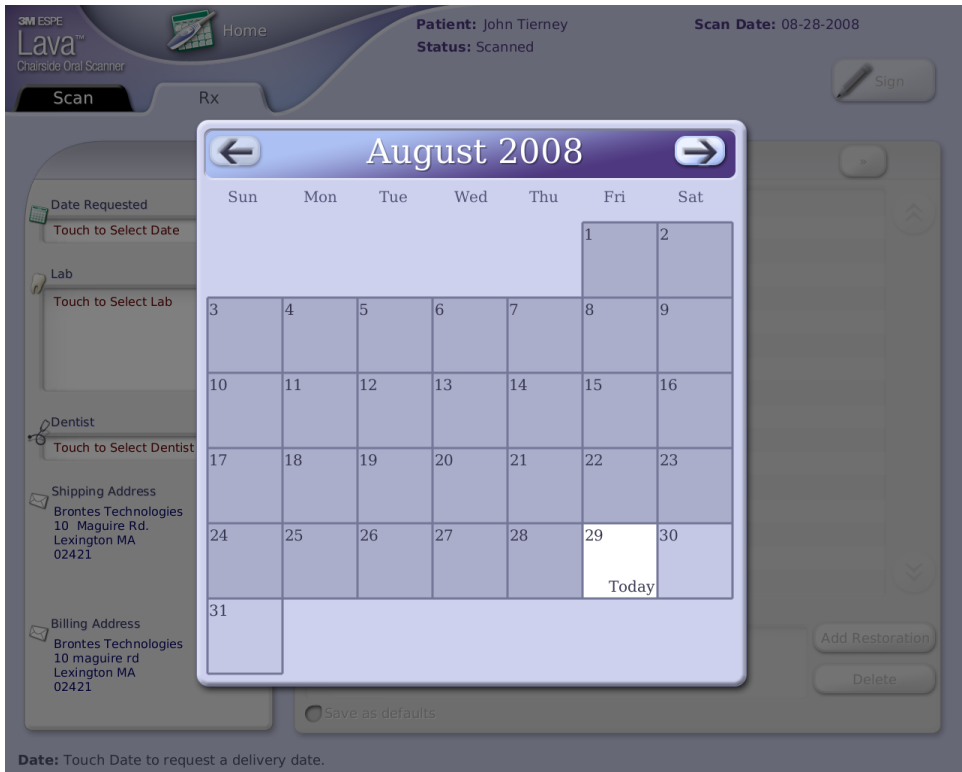
A blank Prescription screen for the patient is displayed.

The screenshot shows the 'Prescription screen' of the 3M ESPE Lava Chairside Oral Scanner. The interface is divided into several sections:

- Header:** Displays '3M ESPE Lava™ Chairside Oral Scanner', a 'Home' button with a calculator icon, 'Patient: John Tierney', 'Status: Scanned', and 'Scan Date: 08-28-2008'. There is also a 'Sign' button with a pen icon.
- Navigation:** Two tabs are visible: 'Scan' (highlighted in black) and 'Rx'.
- Order Form (Left Panel):**
 - Date Requested:** A field with a calendar icon and the text 'Touch to Select Date'.
 - Lab:** A field with a key icon and the text 'Touch to Select Lab'.
 - Dentist:** A field with a key icon and the text 'Touch to Select Dentist'.
 - Shipping Address:** Pre-filled with 'Brontes Technologies', '10 Maguire Rd.', 'Lexington MA', and '02421'.
 - Billing Address:** Pre-filled with 'Brontes Technologies', '10 Maguire Rd.', 'Lexington MA', and '02421'.
- Restoration Details (Right Panel):**
 - Header: 'Restoration 1 of 1' with left and right arrow navigation buttons.
 - Content: A large, empty white area for entering restoration details.
 - Buttons: 'Add Restoration' and 'Delete' buttons at the bottom right.
 - Notes: A 'Notes' section with a text input field and a 'Save as defaults' checkbox.
- Footer:** A note that says 'Date: Touch Date to request a delivery date.'

Prescription screen

2. Touch the Date Requested field to display a calendar. Then touch the requested date on the calendar.



Calendar

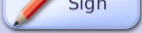
3. Touch the Lab field to display the Lab selection list box, then touch a specific lab to select it.
4. Touch the Dentist field to display the Dentist selection list box. Then touch the name of the dentist who will sign the prescription.
5. Enter the information required, including:
 - restoration type
 - selected and missing teeth
 - options for restoration materials
 - shade selections, etc.
 - notes for the restoration



Prescription screen in progress

When you touch a line, the appropriate selection box will pop up.

Note: You do not have to fill out each field if it's not relevant to, or required for, the case. Instead, you can leave these fields empty.

6. Make sure all the information is correct, then press the **Sign** button  to display the Prescription Digital Signature keypad.
7. Enter your PIN to sign the prescription. The system automatically schedules the case to be sent for processing.

Your license number must also be part of your profile before you can sign prescriptions. This number is entered in the License field of the Users screen. (See Appendix B, Management Screens, "Management screen/Settings tab/Users.")

Additional Restoration

To add another restoration, before you sign the prescription, touch the **Add Restoration** button and step through the process again.

Delete Restoration

To delete a restoration, touch the **Delete** button. The Lava COS will ask you to confirm.



Save as Defaults

You can use the **Save as Defaults** option on the prescription screen to save the current lab and restoration selections as your defaults. In this way you don't have to re-enter the same information for each prescription.

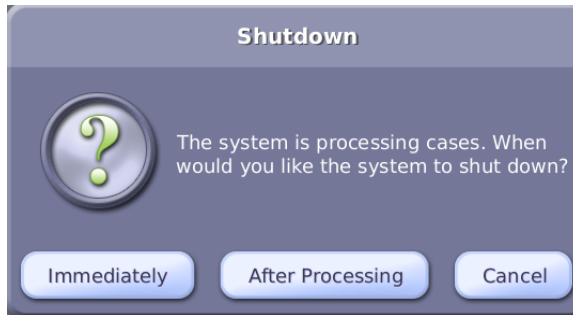
After you fill out a prescription, select the Save as Defaults option. When you fill out a subsequent prescription, select the saved default from the restoration type pop-up.

Uploading Cases

The system handles the uploading of cases (scan, video and prescription data) automatically. The system will display one of the following icons:

Icon	Meaning
	The system is working properly.
	<p>The system cannot upload cases. This may be because the Lava C.O.S. is out of range. Try moving the device closer to your wireless access point. If that doesn't work, call Customer Service.</p> <p>This icon also may appear temporarily when the Lava C.O.S. is reconnecting its Case Manager connection.</p>

If the operator tries to shut down the system while cases are being processed, it displays this warning message:



Shut Down warning dialog box

The operator can then choose to cancel the shutdown request, instruct the system to shut down after the cases have been processed, or shut down the system immediately.

If the operator chooses to shut down immediately, for example, to move the device out of the operatory, processing will restart automatically the next time the device is plugged in and the system is powered up.

Note: Cases do not get processed or uploaded when the device is shut down. If you choose to shut down immediately, it is recommended you plug the device back in and restart as soon as feasible.

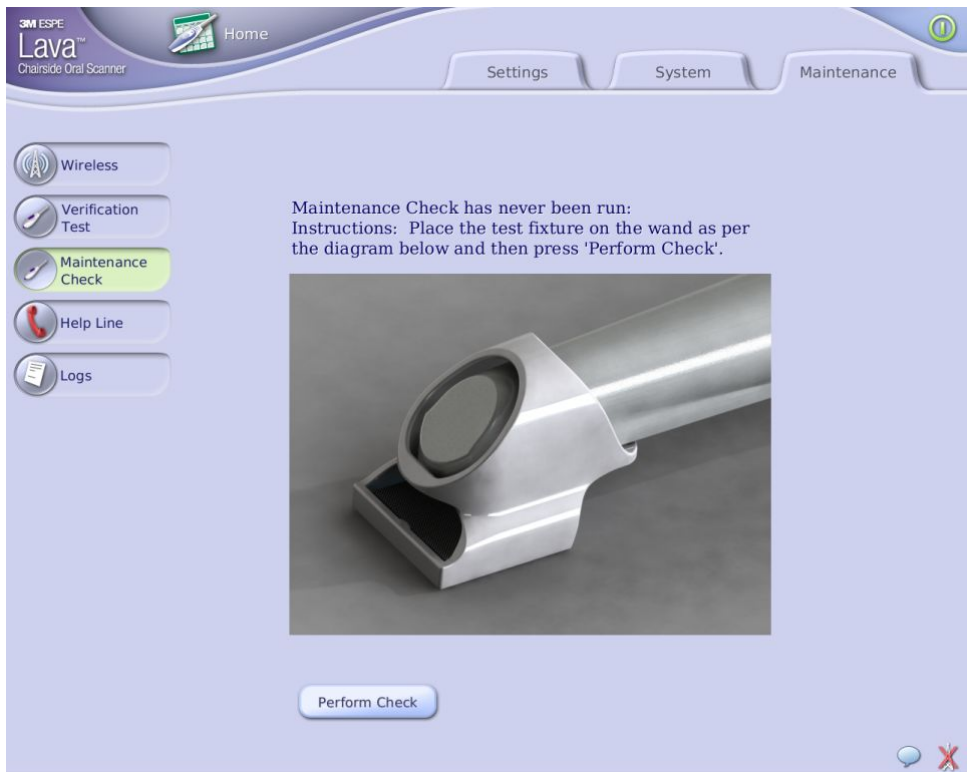
Maintenance Check

Once a week, when you log out or shut down the Lava C.O.S., the system will prompt you to perform a maintenance check of the wand. (If the maintenance check needs to be run when not prompted, access it from the Maintenance tab of the Management screen.)

Just place the test fixture (included with the Lava C.O.S. at the time of installation) over the tip of the wand as shown, then press the Maintenance Check button.







The check only takes a few seconds. Upon completion of the test, you may continue with the process of logging out of, or shutting down the system.




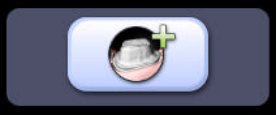
Note: The test fixture has a magnetic back so it can be attached to the metal wand holster for storage. If the test fixture is lost or misplaced, please contact Lava C.O.S. support to acquire a new test fixture.










Maintenance Check

Scan and Review Screen Toolbar Icons






Icon/Button	Use it to:
	<p>Choose to scan the upper arch. (After the arch has been scanned, the icon displays in color.)</p>
	<p>Choose to scan the lower arch. (After the arch has been scanned, the icon displays in color.)</p>
	<p>Select which bite to scan to create a registration. (After the bite has been scanned, the icon displays in color.)</p>
	<p>Additional scan – for making a review model to show design intent.</p>
	<p>Identify a prepped tooth both by number and on the scan.</p>
	<p>Start and stop a scan by pressing this button on the screen (or on the wand).</p>

Icon/Button	Use it to:
	<p>Use the wand's camera to inspect the field. Similar to using an intra-oral video camera.</p>
	<p>Delete the last scan or all scans of a selected arch.</p>
	<p>Warm up the wand to prevent fogging. The wand will light for up to 2.5 seconds.</p>
	<p>Proceed directly to Prep Selection screen.</p>



Scan and Review Screen Display Manipulation Icons

Icon/Button	Use it to:
	<p>Decrease/increase the size of the scan displayed on-screen.</p>
	<p>Rotate the scan about its center point.</p>
	<p>Shift the scan left or right, up or down.</p>
	<p>Return to the initial view of the scan.</p>
	<p>Auto-rotate the scan about its center point.</p>
	<p>Temporarily fills in holes to present the image of a complete scan for presentation.</p>
	<p>Scan Rewind – Rewind the scan in 10-second increments, or back to last saved scan.</p>

Margin Annotation Icons

Icon/Button	Use it to:
	Display the image in 3D.
	Touch the scan to review the prep area.
	Add a dot to the margin.
	Remove a dot.
	Magnify image (without placing dots).

Case Manager Connectivity Status Icons

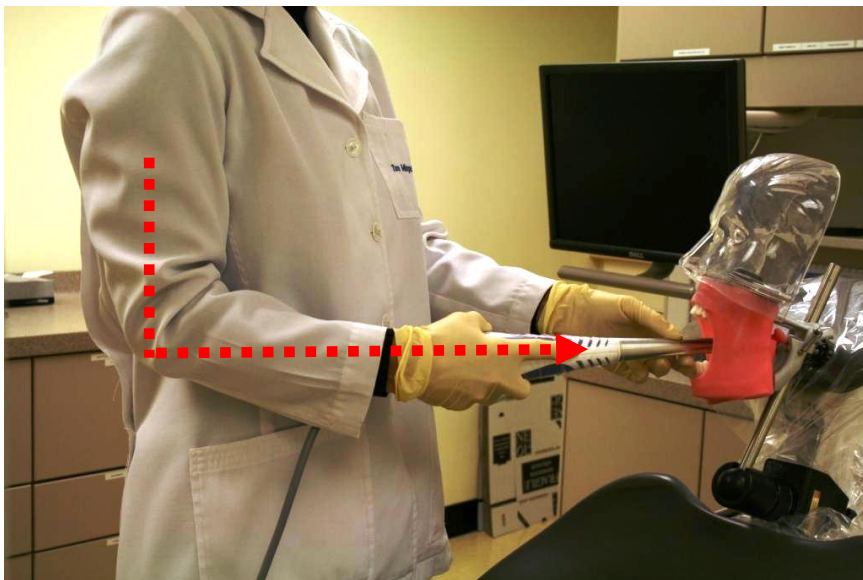
Icon	Meaning
	The system is working properly.
	<p>The system cannot upload cases. This may be because the Lava C.O.S. is out of range. Try moving the device closer to your wireless access point. If that doesn't work, call Customer Service.</p> <p>This icon also may appear temporarily when the Lava C.O.S. is reconnecting its Case Manager connection.</p>

Scanning Recommendations and Tips

We recommend the standing position when scanning a patient. Place yourself between the 7 o'clock and 9 o'clock position in relation to the patient.

When scanning posterior teeth, keep the elbow of your scanning arm bent at 90 degrees. This is the most natural, comfortable position to use for scanning and also helps keep the scanner aligned with the occlusal plane of the teeth. You should also turn the patient's head to ensure the wand is aligned with the occlusal plane.

Hold the wand using the handshake grip (see "The Grip" on the next page). Use your non-dominant hand as a fulcrum for the wand.



Scanning Posterior Teeth

For anterior teeth, position the wand vertically.

The Grip

This recommended “handshake” grip will allow you to comfortably control the wand.

“Handshake” Grip – Reach out with your dominant hand (right hand for right-handers), as if preparing to shake hands with someone, then press your palm against the side of the wand. Grasp the wand so that your index finger extends along the side of the wand, as pictured. Anchor your other hand on the patient (two possibilities are shown below). Turn the wand with your dominant hand.



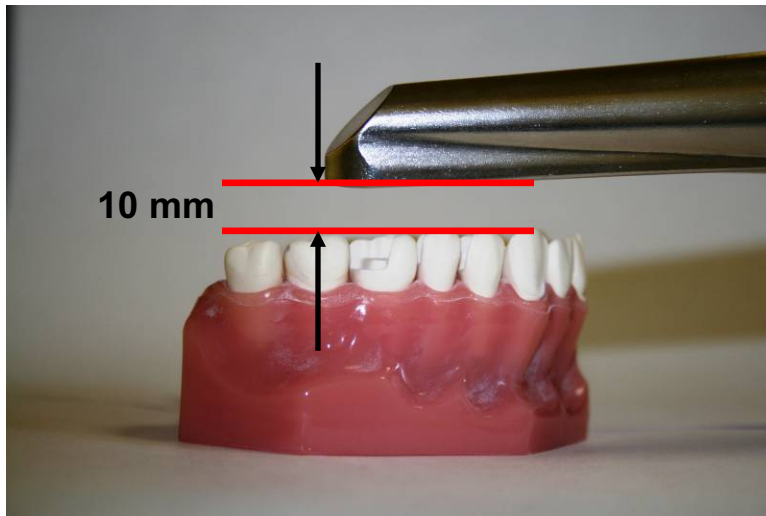
Handshake grip



Alternate placement of supporting hand

General Scanning Tips

- Look at the touch screen—not in the mouth—when scanning.
- Keep the lens of the wand parallel to the surface you're scanning.
- Working distance – The wand has a working distance of 5mm to 15mm from the lens located at the tip of the wand. For best scan quality, keep the lens approximately 10mm above the surface being scanned, as shown by the depth indicator.









Proper scanning distance



Appendix A: Status Icons

The Status icons associated with a case are color coded.


Blue is the normal status, requiring no attention. Yellow means some user attention is required. Red means either a failure, or that a case has required attention for a long time and you may need to contact Customer Support.

Touch the status icon and a message line at the bottom of the Attention tab displays more details about the case including instructions on what, if anything, is required next.

	<p>Case in progress; still requires user action, e.g., a scan or a prescription.</p>
	<p>Needs user's attention. Case was modified at least 2 days ago but has not yet been signed.</p>
	<p>The information for a signed case conflicts in some way with the information used by the system that uploads cases. The case requires immediate attention or has required attention for some time.</p>
	<p>Case's prescription has been signed and the Lava C.O.S. is processing it.</p>
	<p>A case was signed 2 or more days ago but the system has not yet started to upload the case.</p>
	<p>A signed case has a critical issue that should be addressed.</p>

	The Lava C.O.S. has successfully processed and uploaded the case.
	This case was manually archived by an earlier version of the software (pre-1.5).

Appendix B: Management Screens

Select the Management button  on the Home screen to display the Management screen. There are three tabs in this section: Settings, System, and Maintenance.

The Management screens are generally designed for the use of 3M ESPE Customer Service. For example, they may need to go to the Management screen to check the wireless connection or to get system information and messages from the unit.

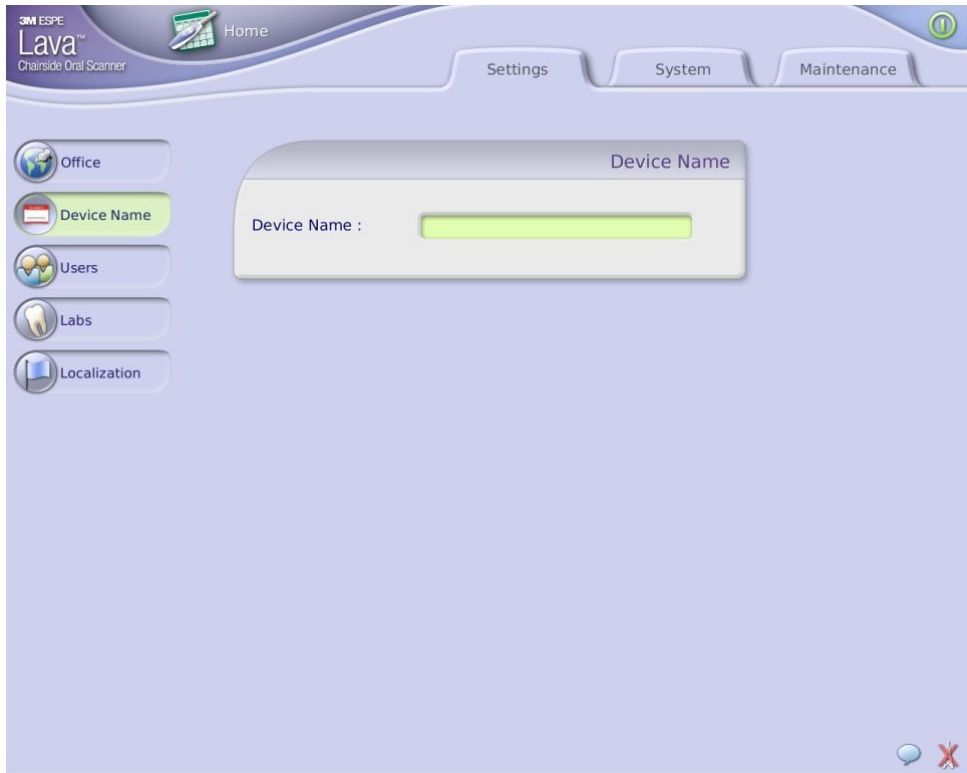
There are some management features you will use occasionally, for example, adding a new user and assigning a name to the device.

Dental operators may make use of the screens under the Settings tab. This tab includes office, user, and lab information.



Management screen > Settings tab > Office

To edit the information on this screen, press the Edit button then use the on-screen keyboard to type in the information that has changed. Required fields are marked with an asterisk. Press OK when you've completed the changes.



Management screen > Settings tab > Device Name

You can create a name for your Lava C.O.S. This capability is helpful for distinguishing between multiple Lava C.O.S. devices on your office's account.



Management screen > Settings tab > Users

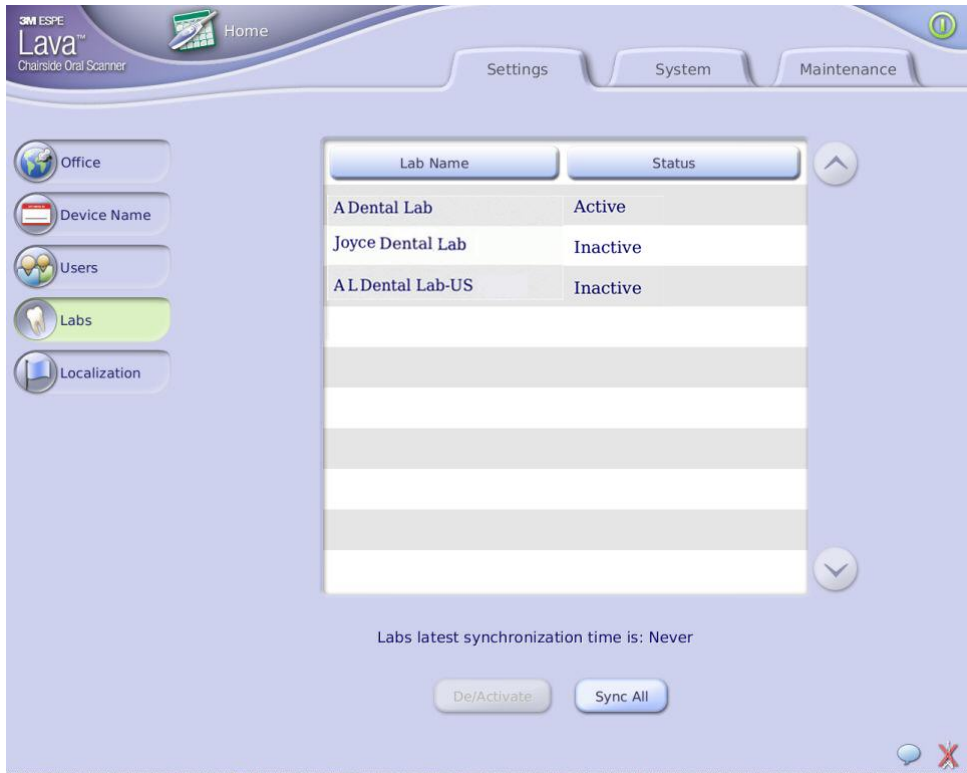
This screen lists the system's users and their status: active or inactive.

To add a user to this system, select the New button and use the on-screen keyboard to type in the relevant information. Select OK when done.

Edit the information for a user by selecting the Edit button and typing in the new information.

Important Note: This information will include the doctor's license number, which is added to the License field. This is required for signing electronic prescriptions.

To make a user active or inactive, select the user name. It will be displayed in red. Then press the Activate or Deactivate button, as appropriate.



Management screen > Settings tab > Labs

This screen displays the list of labs 3M has entered into the system along with their status, determined by the dental practice.

To make a lab inactive (for example, your dental practice does not use the lab), select the lab's name and press the Deactivate button.

3M ESPE will update the list of available labs periodically and automatically. If there is a lab your practice would like to add to the list, please contact 3M ESPE customer support.

3M ESPE updates the settings on the Lava C.O.S as needed, on a daily basis. To synchronize the data on your system promptly with that of 3M ESPE (for example, if a 3M ESPE customer support person asks you to do this by phone), press the **Sync All** button.



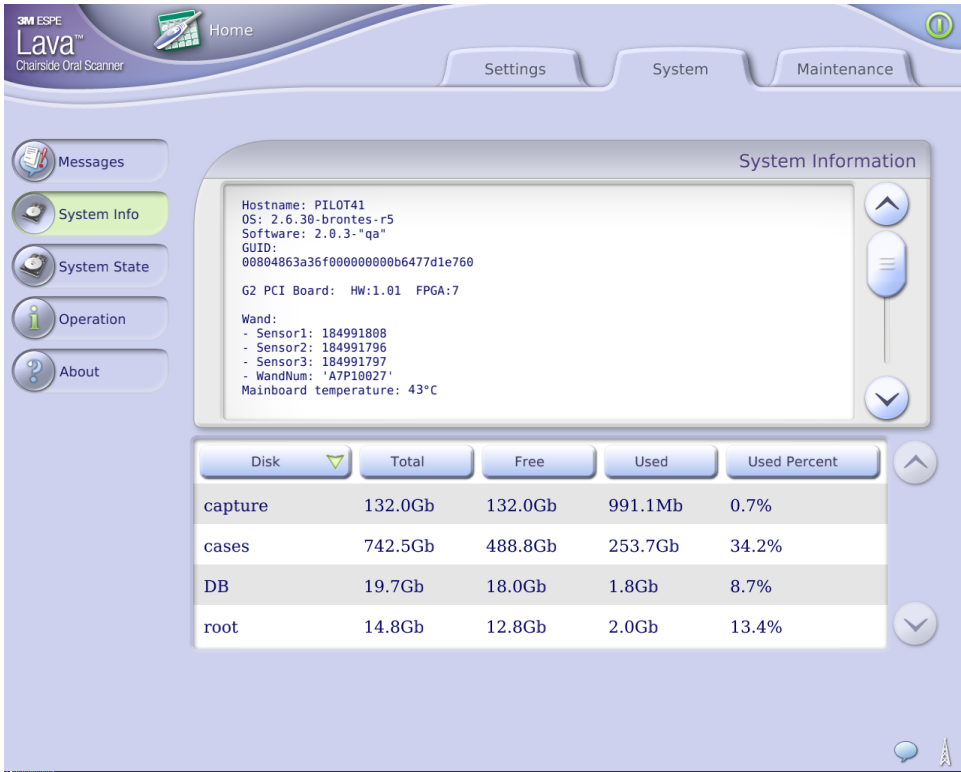
Management screen > Settings tab > Localization

This screen is used to select localization information for the system, including time zone and tooth layout.



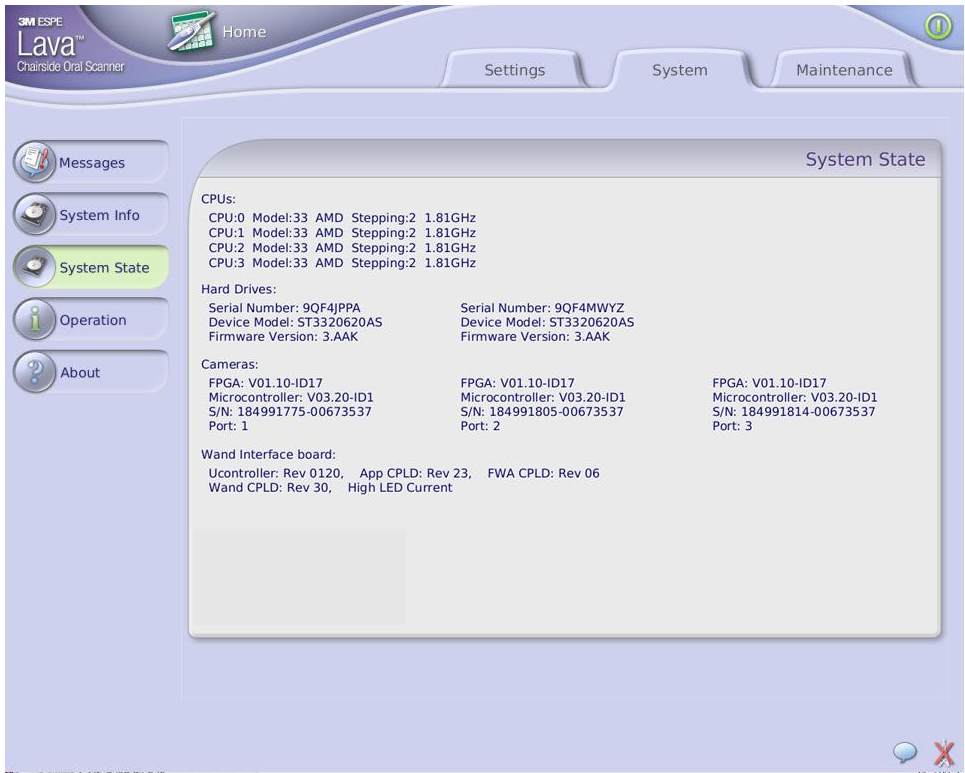
Management screen > System tab > Messages

System messages are displayed here.



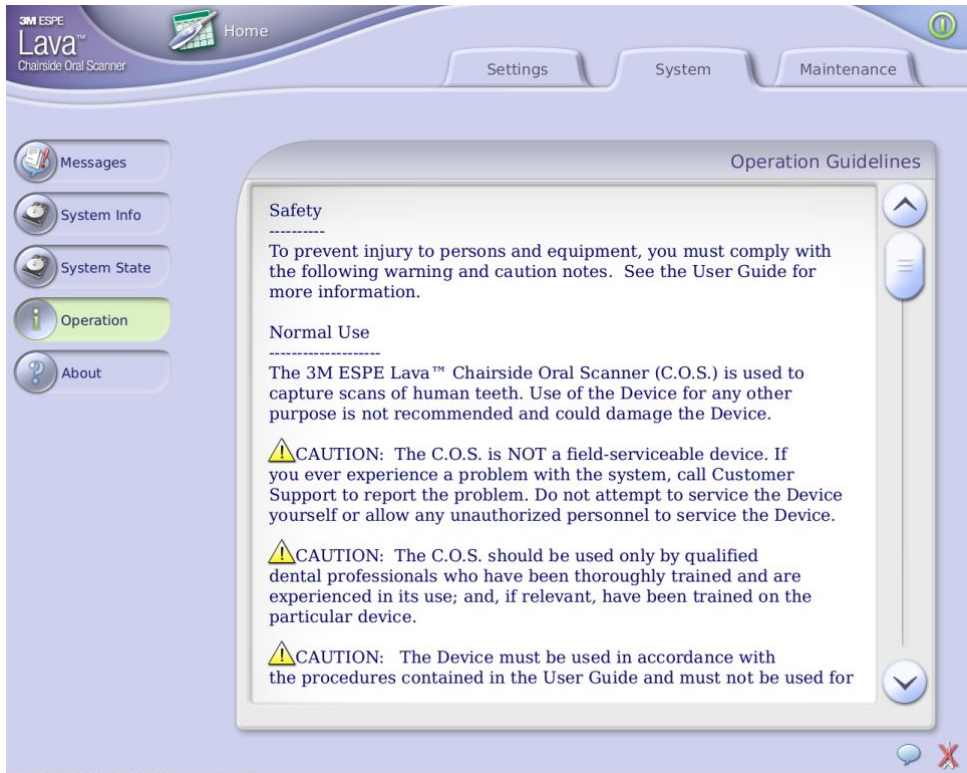
Management screen > System tab > System Info

This screen displays a wide range of system information.



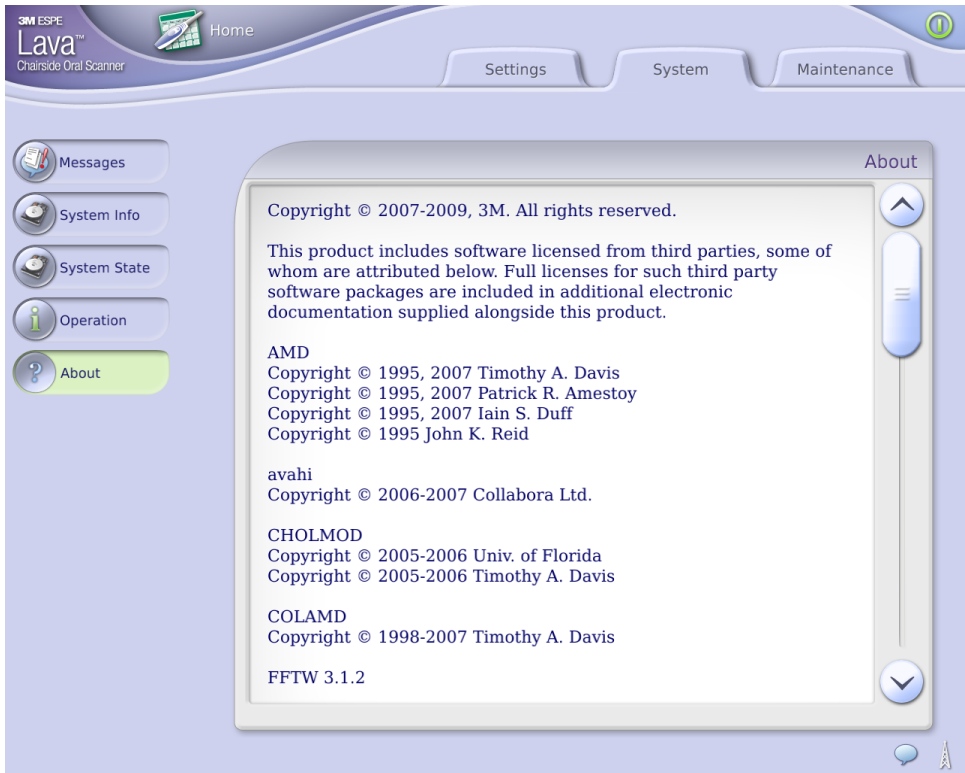
Management screen > System tab > System State

This screen displays information about the hardware of the Lava C.O.S.



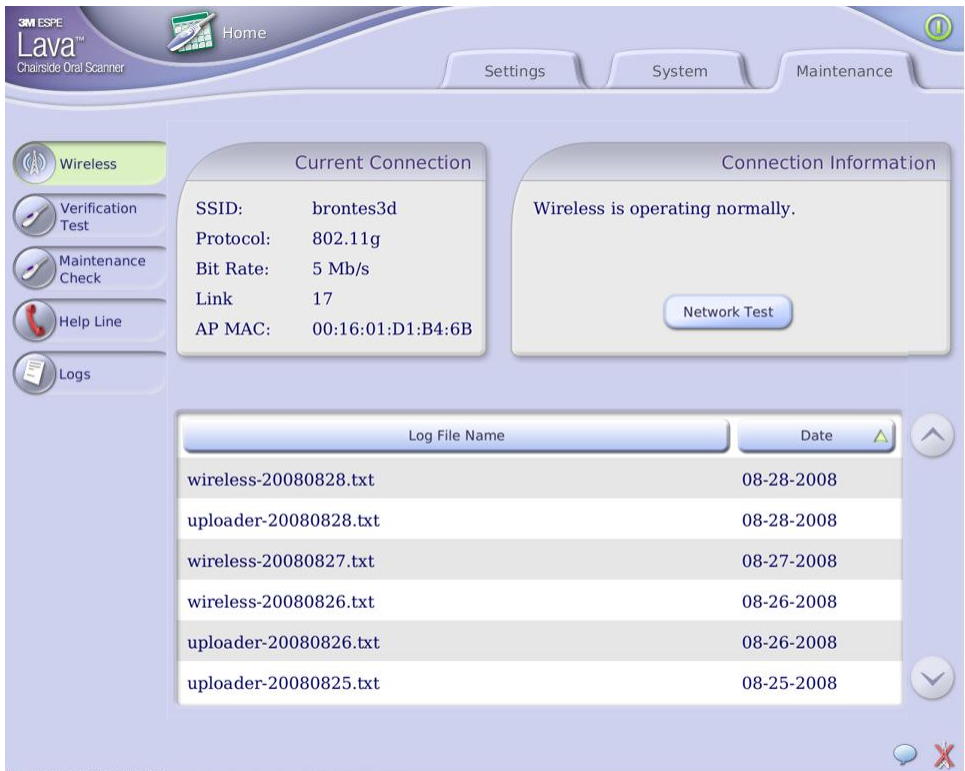
Management screen > System tab > Operation

Operational and safety guidelines for the Lava C.O.S. are displayed here. These are the same guidelines printed in this *User Guide*.



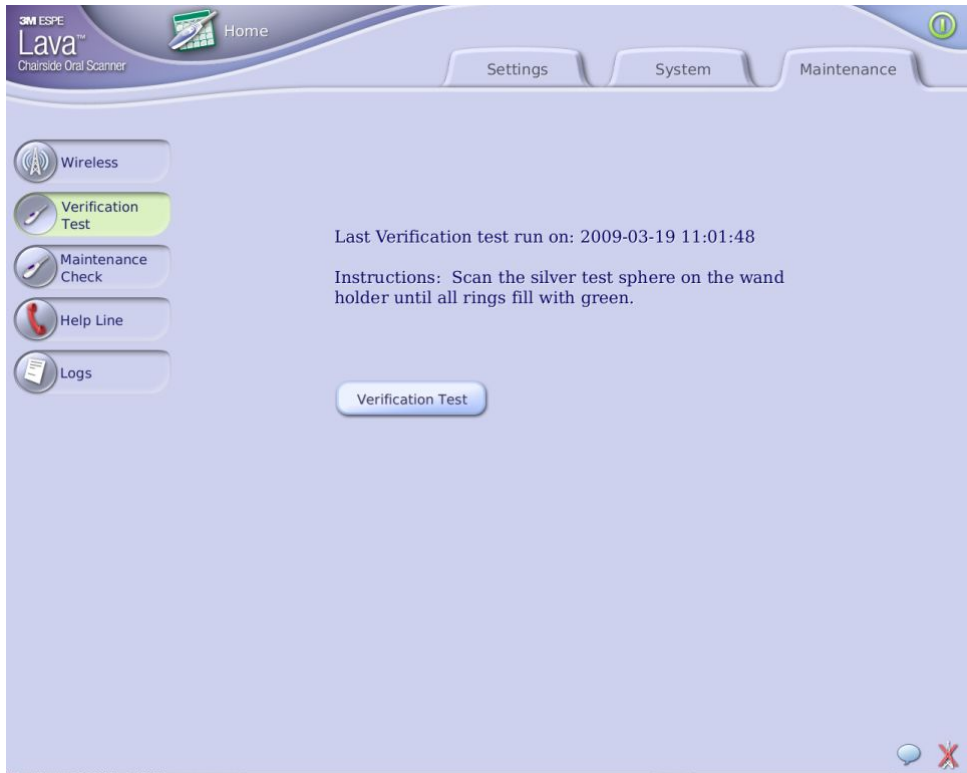
Management screen > System tab > About

This screen displays information about the system, i.e., copyright and software information.



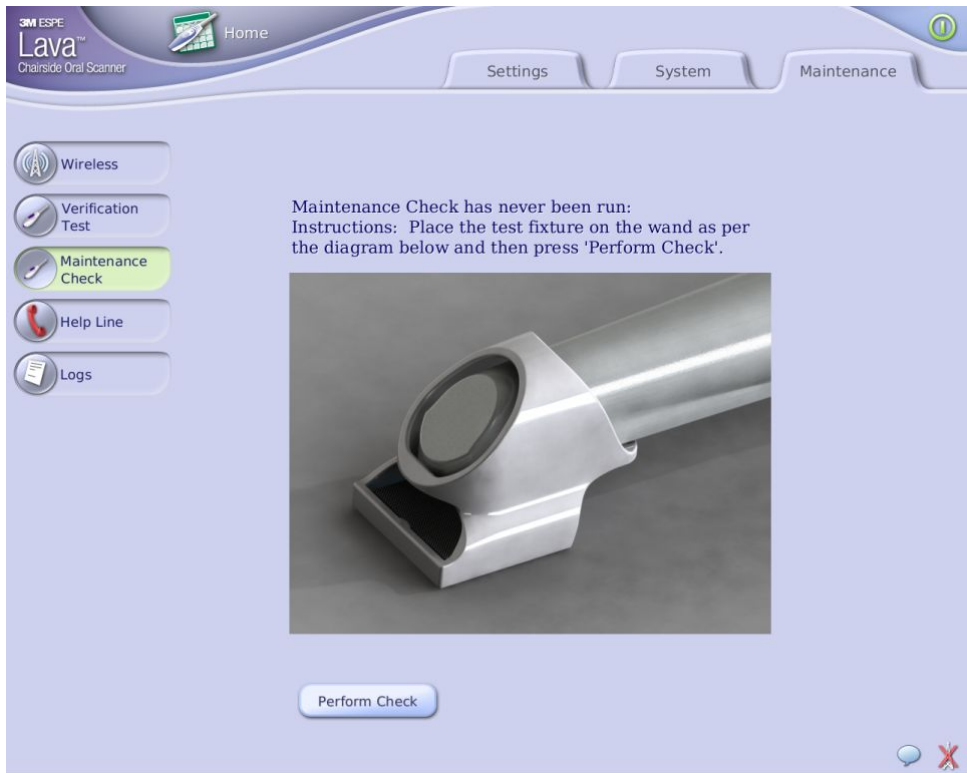
Management screen > Maintenance tab > Wireless

This screen displays information about the system's wireless connection.



Management screen > Maintenance tab > Verification Test

This screen displays the last time the system verification test was run. You can run the Verification Test at any time from this screen.



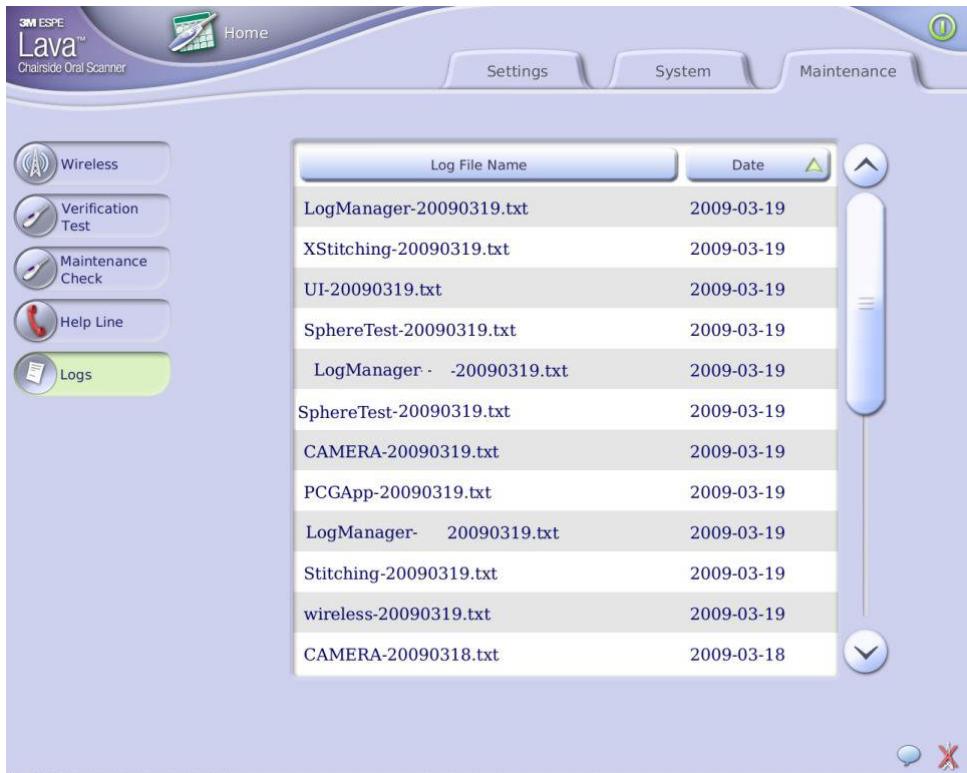
Management screen > Maintenance tab > Maintenance Check

This screen displays the last time the Maintenance Check was run. You can also perform a maintenance check of the wand by following the on-screen instructions.



Management screen > Maintenance tab > Help Line

If you need help with the system, go to the Help Line button on this screen and call the Customer Support number. You will be given instructions on how to proceed.



Management screen > Maintenance tab > Logs

Customer Support uses this screen to display system logs.

Appendix C: Active Wand Buttons

In addition to the Start/Stop button on the wand, you can press the left and right arrow buttons to move through menus when scanning. You cannot, however, use any of the wand buttons to select areas on a scan.

Press the Select button on the wand to make a selection from an on-screen menu. If the Maxillary Flip feature is active, the Select button mimics the on-screen Home Base button.

Support Contact Information

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General: +1 (781) 541-5200

Customer Service and Support: 1-877-SCAN-LAVA (1-877-722-6528)

Customer support email: cossupport@mmm.com

Lava C.O.S. Serial Number:

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