

Virtual Light Booth



User Guide



Consult this documentation in all cases where the Attention symbol  appears. This symbol is used to inform you of any potential HAZARD or actions that may require your attention.

CE Declaration



Hereby, X-Rite, Incorporated, declares that this model is in compliance with the essential requirements and other relevant provisions of Directive(s) 2014/35/EU (LVD), 2014/30/EU (EMC), and RoHS EU 2015/863.

Federal Communications Commission Notice

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

Industry Canada Compliance Statement

CAN ICES-3 (A) / NMB-3 (A)

Equipment Information



Use of this equipment in a manner other than that specified by X-Rite, Incorporated may compromise design integrity and become unsafe.

WARNING: This device is not for use in explosive environments.

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

Complies with US FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007 or equivalent.



For indoor use only.

CAUTION! DO NOT connect to an ungrounded outlet. DO NOT use with 2-wire extension cords or adaptors.



Instructions for disposal: Please dispose of Waste Electrical and Electronic Equipment (WEEE) at designated collection points for the recycling of such equipment.

Safety Information



- **PLEASE READ AND FOLLOW INSTRUCTIONS:** Read and follow all instructions before you attempt to assemble, install or operate the unit.
- **NOTICE:** There are no user serviceable parts in this product. All warranty and non warranty repairs should be referred to X-Rite, Incorporated.
- **RETAIN THIS MANUAL FOR FUTURE REFERENCE:** Once you have read this manual, keep it handy for others to read or refer to when they need to operate the unit.
- **OBEY WARNINGS:** Please comply with all warnings and safeguards that we provide in this manual. They have been written to keep you and your unit safe. If the unit is used in a manner not specified in this manual, the protection provided by the unit may be impaired.
- **CAUTION:** Use of controls of adjustments or performance or procedures other than those specified herein may result in hazardous radiation exposure.
- **USE ONLY A PROPER POWER SOURCE:** Use the proper power source for this unit. Consult the power label on the back of the unit for this information. Operation with a power source not specified on the power label may result in inaccurate lighting conditions, damage to the equipment, and possible personal injury.
- **DO NOT BLOCK VENTS:** The luminaire(s) should be installed so that it is a minimum of 200 mm (8 in.) from each other or wall surface. Refer to the installation Guidelines later in this manual. Light sources contribute heat to the area of operation. Blocking of the vent could result in overheating, mechanical failure, and a fire hazard if flammables or combustibles are present.
- **PROTECT FROM WATER AND MOISTURE:** Do not use it in an area where there is possible hazard of electric shock from spilled water or other liquids or uncontrolled moisture.
- **CLEAN PROPERLY:** You can wipe the unit with a clean, white lint-free cloth. Do not apply liquid cleaners or agents containing wax, since these can yellow and change reflectance and gloss properties. Clean outer surfaces with a dampened cloth containing a mild soap.
- **CAREFULLY HANDLE THE LAMPS AND DAYLIGHT FILTERS:** Allow the lamps and daylight filters to cool before handling them. Always use lens paper or an equivalent to handle any of the replacement tungsten lamps. Skin oils interfere with lamp performance.
- **EMERGENCY SHUT-OFF:** The unit should be installed near a main power shut-off switch in the event of an emergency.
- **DRAWER CAPACITY:** Do not exceed 6.8 kg (15 lbs) weight in the front drawer of the device.



Diffuser, filters and lamps get hot during operation. Allow time to cool before touching.

Proprietary Notice

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Publication of this information does not imply any rights to reproduce or use it for purposes other than installing, operating, or maintaining this device described herein. No part of this manual may be reproduced, transcribed or translated into any language or computer language in any form or by any means: electronic, magnetic, mechanical, optical, manual, or otherwise; without the prior written permission of an authorized officer of X-Rite, Incorporated.

Patents: www.xrite.com/ip

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Warranty Information

X-Rite warrants this Product against defects in material and workmanship for a period of twelve (12) months from the date of shipment from X-Rite's facility, unless mandatory law provides for longer periods. During such time, X-Rite will either replace or repair at its discretion defective parts free of charge.

X-Rite's warranties herein do not cover failure of warranted goods resulting from: (i) damage after shipment, accident, abuse, misuse, neglect, alteration or any other use not in accordance with X-Rite's recommendations, accompanying documentation, published specifications, and standard industry practice; (ii) using the device in an operating environment outside the recommended specifications or failure to follow the maintenance procedures in X-Rite's accompanying documentation or published specifications; (iii) repair or service by anyone other than X-Rite or its authorized representatives; (iv) the failure of the warranted goods caused by use of any parts or consumables not manufactured, distributed, or approved by X-Rite; (v) any attachments or modifications to the warranted goods that are not manufactured, distributed or approved by X-Rite. Consumable parts and Product cleaning are also not covered by the warranty.

X-Rite's sole and exclusive obligation for breach of the above warranties shall be the repair or replacement of any part, without charge, which within the warranty period is proven to X-Rite's reasonable satisfaction to have been defective. Repairs or replacement by X-Rite shall not revive an otherwise expired warranty, nor shall the same extend the duration of a warranty.

Customer shall be responsible for packaging and shipping the defective product to the service center designated by X-Rite. X-Rite shall pay for the return of the product to Customer if the shipment is to a location within the region in which the X-Rite service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations. Proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the unit is within the Warranty period must be presented to obtain warranty service. Do not try to dismantle the Product. Unauthorized dismantling of the equipment will void all warranty claims. Contact the X-Rite Support or the nearest X-Rite Service Center, if you believe that the unit does not work anymore or does not work correctly.

THESE WARRANTIES ARE GIVEN SOLELY TO BUYER AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR APPLICATION, AND NON-INFRINGEMENT. NO EMPLOYEE OR AGENT OF X-RITE, OTHER THAN AN OFFICER OF X-RITE, IS AUTHORIZED TO MAKE ANY WARRANTY IN ADDITION TO THE FOREGOING.

IN NO EVENT WILL X-RITE BE LIABLE FOR ANY OF BUYER'S MANUFACTURING COSTS, OVERHEAD, LOST PROFITS, GOODWILL, OTHER EXPENSES OR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES BASED UPON BREACH OF ANY WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT, OR ANY OTHER LEGAL THEORY. IN ANY EVENT OF LIABILITY, X-RITE'S MAXIMUM LIABILITY HEREUNDER WILL NOT EXCEED THE PRICE OF THE GOODS OR SERVICES FURNISHED BY X-RITE GIVING RISE TO THE CLAIM.

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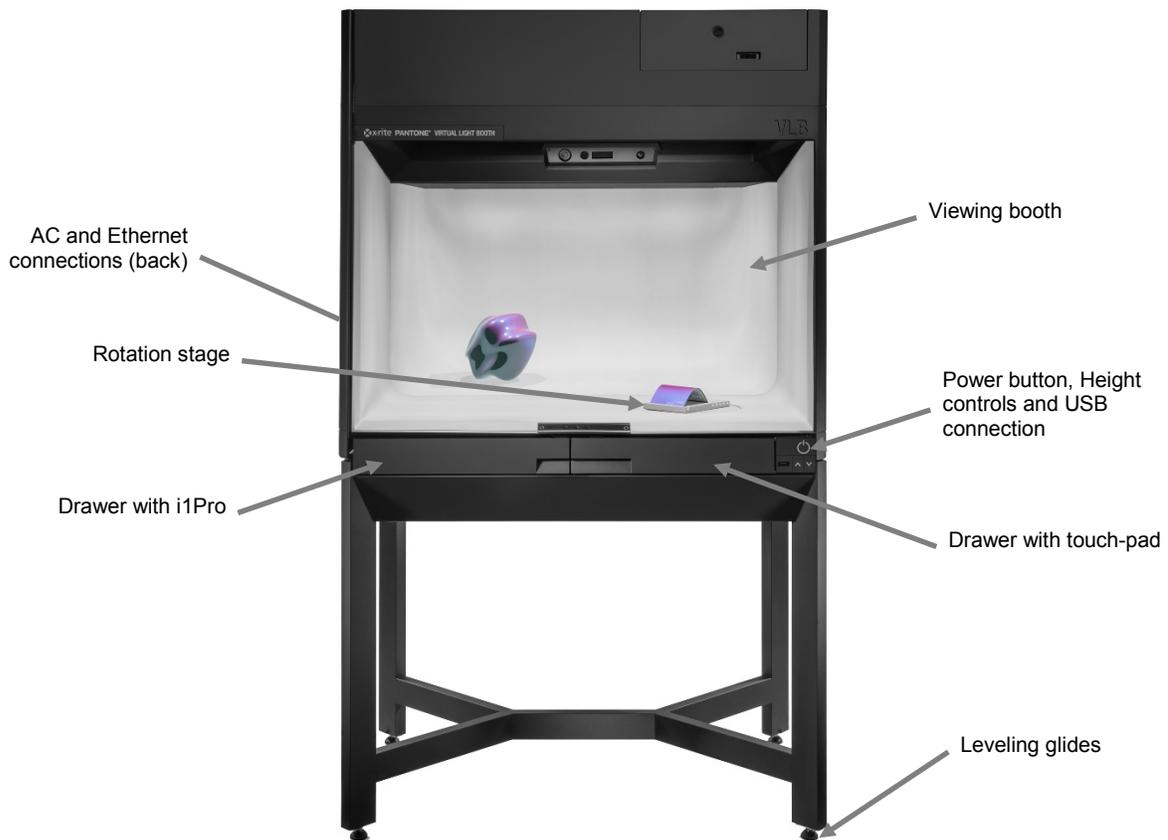
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OVERVIEW AND INSTALLATION

The X-Rite Virtual Light Booth (VLB), a component of the X-Rite Total Appearance Capture (TAC™) Ecosystem, presents virtual materials with a very high degree of realism and accuracy. This enables users to evaluate digitized materials rendered on virtual objects in direct comparison to physical material samples.

The Virtual Light Booth provides diffuse and spot light sources that enable accurate visual assessment in a well-defined and standardized visual observation environment, even for highly complex materials such as special-effects paints and coatings whose color and appearance change based on the angle at which they are being observed.

The system includes integrated camera-based sensors, spectrophotometers, colorimeters and the synchronization of real-time rendering based on X-Rite's patent-pending Full Immersion Technology. This ensures the most accurate available material evaluation environment.



Packaging Information

Please keep your shipping crate in case you need to return your device to the factory for service.

Your device packaging should contain all the items listed below. If any of these items are missing or damaged, contact X-Rite or your Authorized Representative.

- Virtual Light Booth
- Accessory Box (AC line cord, Ethernet cable, Three sample holders, Rotation stage, Calibration curtain, i1 Pro instrument, Leveling glides)

VLB Installation Guidelines

Please take the following precautions to ensure the best environment for the use of the device.



- Install on a flat, level surface capable of bearing the load of the device.
- When choosing an installation location, make sure not to block the cooling fan.
- Use the leveling glides to account for imperfections in the floor surface.
- Do not place any items on top of the device.
- Ensure sufficient clearance to the ceiling and walls after installation is completed (see below).



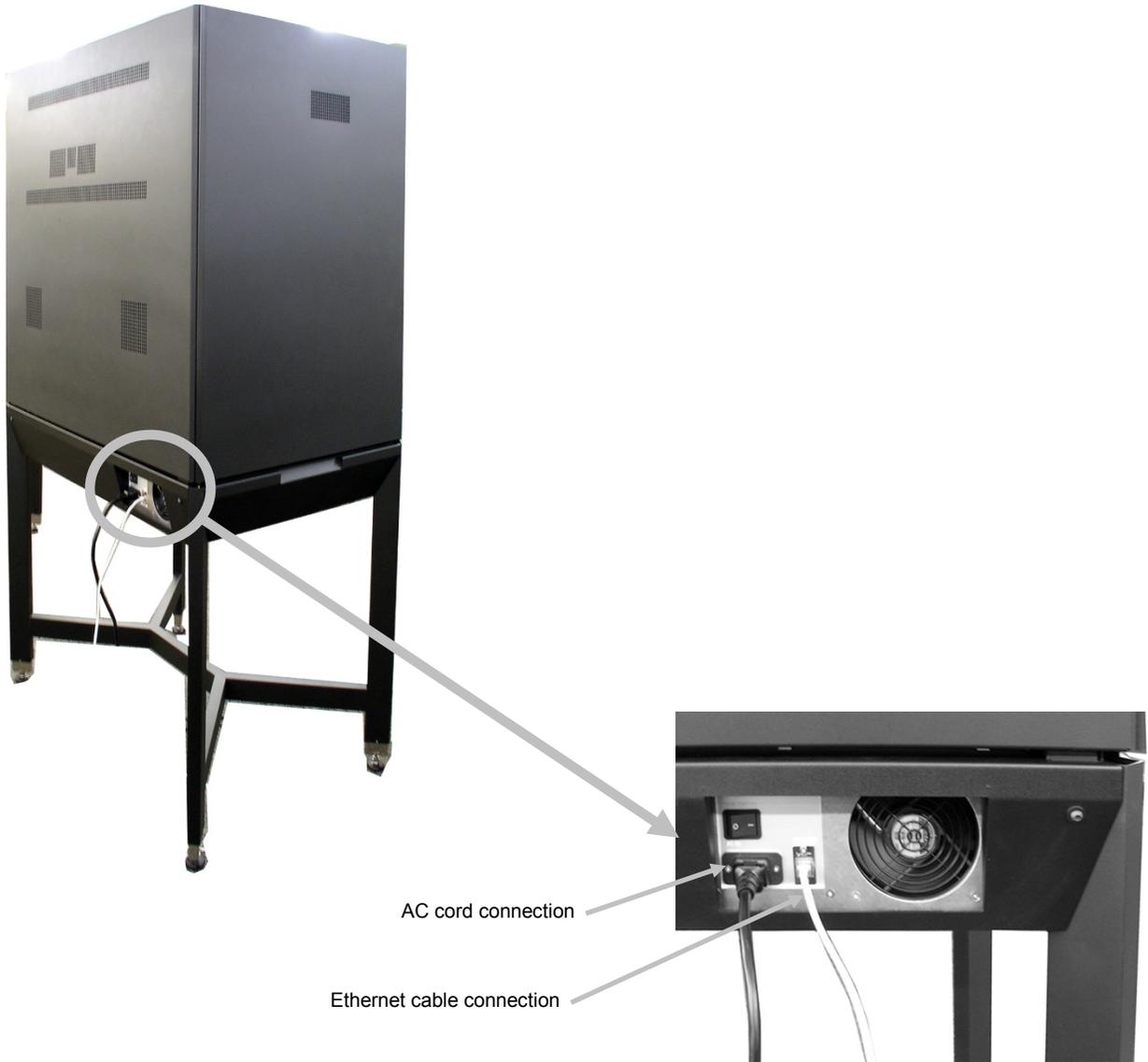
Connecting the VLB

1. Plug one end of the Ethernet Crossover cable into the Ethernet port on your computer. Plug the other end of the cable into the VLB.
2. Connect the AC cord to the VLB and then an easily accessible outlet.



Make sure AC cord is connected to a Dedicated Line – AC power source with a minimum 15 Amp power service.

Discontinue use if AC cord is damaged.



OVERVIEW

Powering the VLB

Toggle the power switch located on the back of the VLB to turn it on.

A power standby button is located on the front panel of the device (see below).



Discontinue use if AC cord is damaged. Ensure AC cord ratings meet or exceed the device ratings (see Specifications section in the Appendices).

Power switch



Front Panel Controls

Power Standby Button

The power standby button is used to power on and power down the device into a low power state.

To power on the device, press the Power button once. To power down the device, press the power button again.

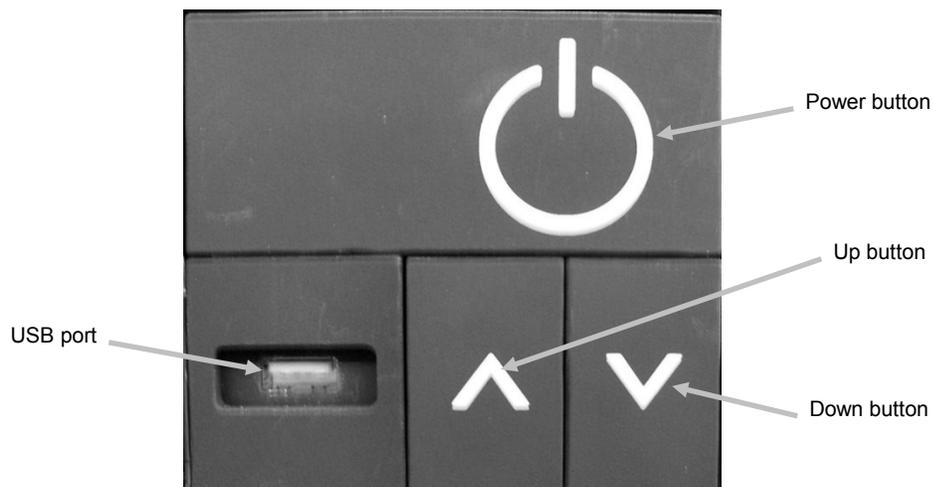
To control the main power to the device, see Powering the VLB above.

Up and Down Buttons

The Up and Down buttons are used to adjust the VLB height to allow for the best viewing angle of the LCD screen.

USB Port

The USB port is used to connect the i1Pro which is required for light calibration.



Touch Pad Definition

Use the touch pad to control the device. It provides functionality to:

- Turn the device on and off
- Control the rotating stage
- Show scenes
- Select materials
- Control the illumination (D65, Spot, Off)
- Perform service functions (e.g., system calibration)

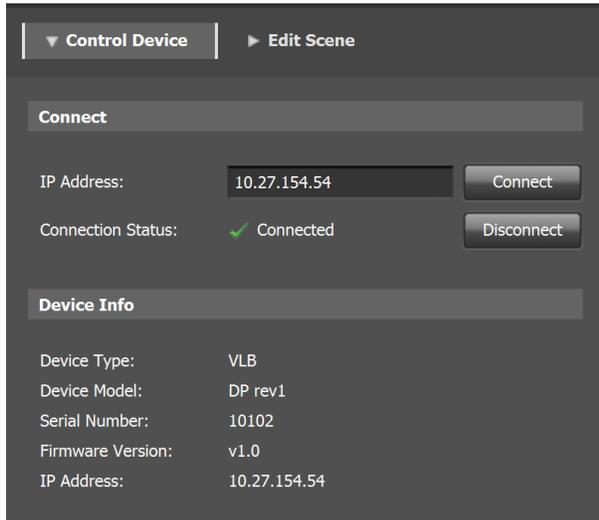
Refer to “Viewing material on the VLB” later in this section for additional information on using the touch pad.

OPERATION

PANTORA

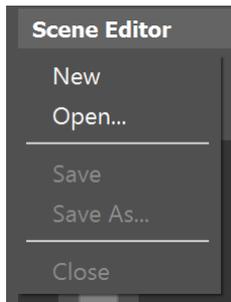
Connect the device

Enter the IP address and click the **Connect** button. Once connected, the device info is displayed and materials and scenes are uploaded to the VLB.

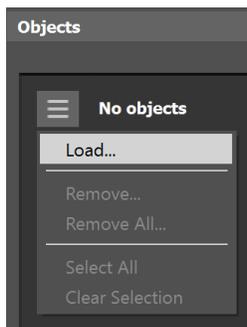


Prepare a scene

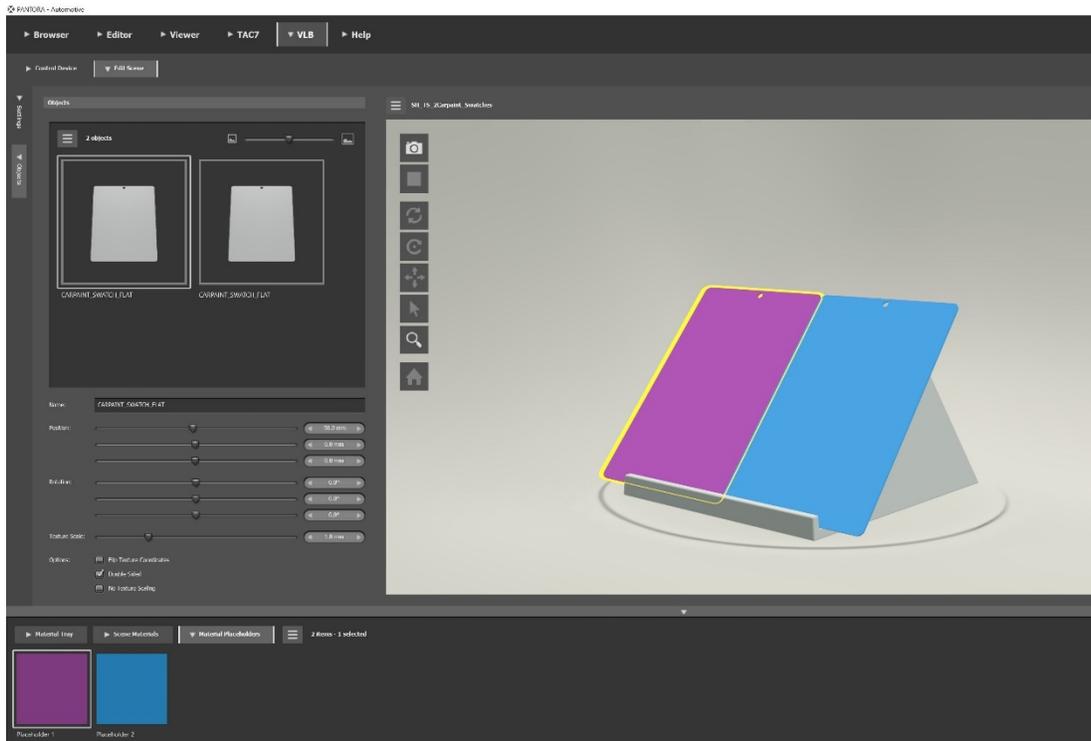
Select **New** from the Scene Editor menu to create a new scene.



The default environment is loaded. You can add new objects if required.

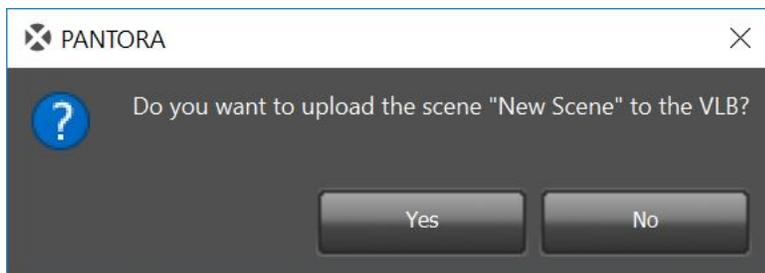


The PANTORA scene editor loads and displays the objects. The objects can be moved or rotated with the sliders or the control buttons. They work the same as in the PANTORA viewer.



After arranging the objects you should define the placeholders for each object. Placeholders are necessary to assigning materials on the VLB touch pad. Click the Material Placeholders tab in the tray to create placeholders. Open the menu list and select New. The name and the color of the placeholders are preselected. You can change both of them if required.

Save the scene in the Scene Editor menu. You are asked if you want to upload the scene to the VLB. Click **Yes** to save the scene to the Scene Editor and upload it to the VLB.

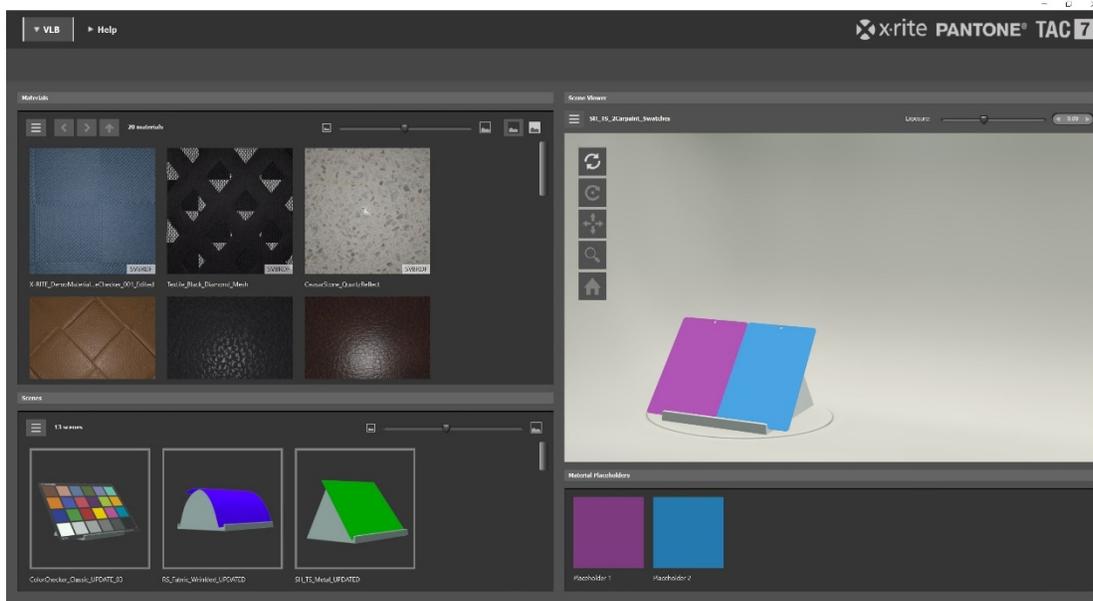


Uploading scenes

The scene tray in the Control Device section shows the available and uploaded scenes.

Load additional scenes from the Scenes menu to upload to the VLB and show them in the scene tray. In order to see the content of a scene drag it into the scene viewer. It shows the selected scene and the available material slots.

X-Rite provides 3 preconfigured scenes with 3 different car paint and fabrics sample holders and a corresponding swatch, which has one material slot assigned. You can load them from the menu in the scenes section.



Viewing material on the VLB

For using the optimum viewing conditions on the VLB, you should:

- Darken the room (doesn't need to be pitch black, but the dimmer the better).
- Position the upper edge of the VLB front-opening at the height of your eyes; you should not be able to look directly into the lamps.
- Switch on Head Tracking and Perspective Rendering to have position-based color correction for the display and correct perspective with respect to the sample.
- Stand centered to the VLB – in asymmetric conditions the gloss or goniochromatic effects (if present) between virtual and real material will not match.
- Allow your eyes to adapt at least 5 minutes to the lighting conditions.
- Make sure that there are no warnings about display calibration in the error log and the display tracking symbol in the symbol bar has disappeared.

Materials and scenes which are uploaded to the VLB are available on the touch pad display and can be operated from there.

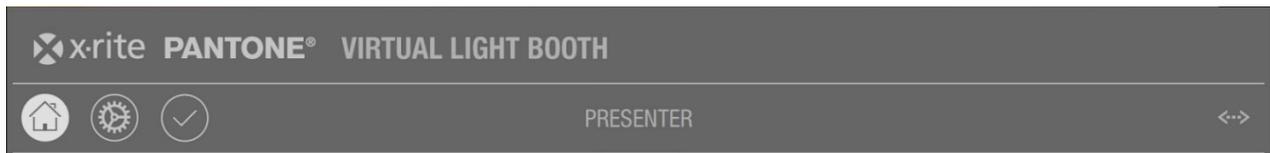
Select and load a scene to view the materials it contains. Tap on the colored material slot, then tap on the material you would like to assign to the corresponding object.

NOTE: If there are already items existing on the VLB which are not available in your scenes or materials section in PANTORA, they are displayed in PANTORA with a question mark. You may remove them from the VLB by right-clicking on the corresponding item in PANTORA.



Control Bar

The top of the touch pad has a control bar which contains button and status icons.



Home button

Returns you from any screen to the Presenter view.



Service button

Used to access service functions: Light Calibration (refer to Light Calibration later in this manual).



Approval button

Used to access the approval tab. Approve or reject measured materials and add comments to them.



Connection Status

This symbol appears when the VLB has a connection to the PANTORA Software.



No Display Tracking

This symbol appears when the display tracking is not active (display in standby mode, illumination switched off). Normally it disappears after 15 seconds once the display tracking is active again. This signals the display is now color corrected.



No Face Tracking

This symbol appears when the face tracking sensor is running but is unable to detect any person in front of the VLB.



Data Transfer

This symbol appears once materials or scenes are uploaded from PANTORA.



Service Calibration

This symbol appears once the service calibration of the VLB has expired.



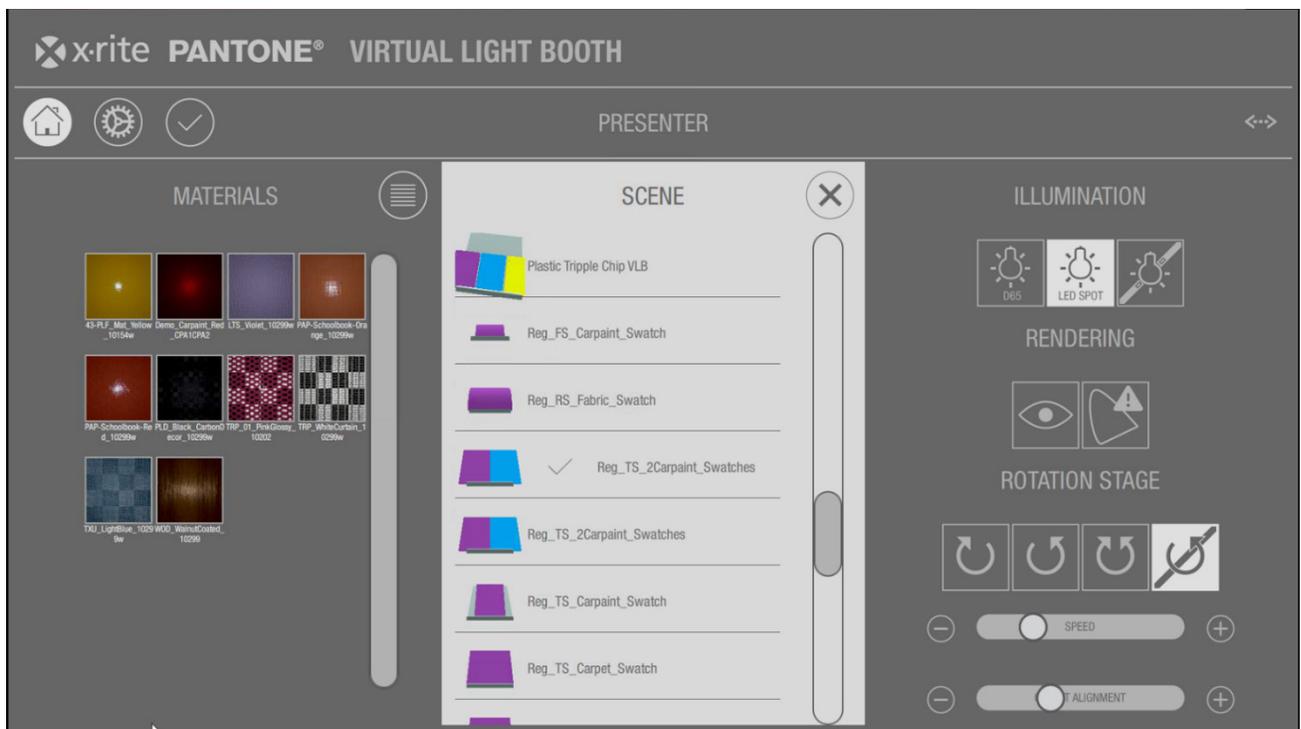
VLB Error

This symbol appears when an error occurs in the VLB system. If the error is automatically resolved by the software, this symbol will also disappear again.

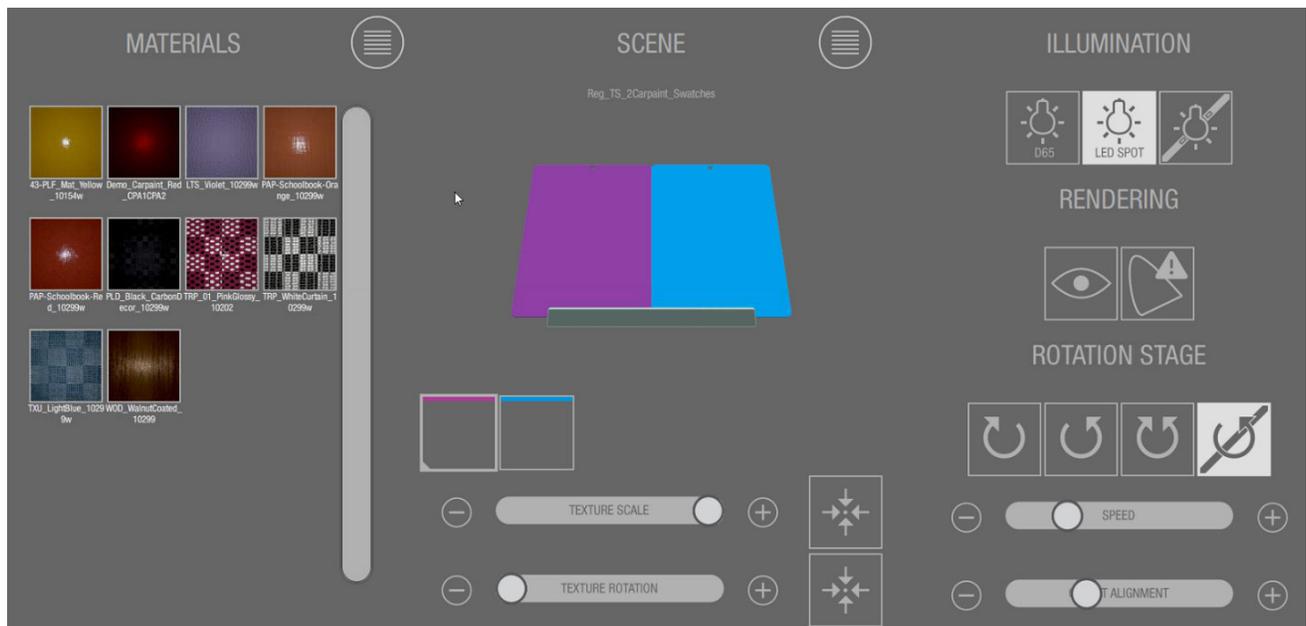
Scene List

The scene list shows the list of available scenes. The currently loaded scene is indicated with a check mark.

You can scroll through the available scenes using the scroll bar. Once you see the desired scene in the list, tap it to load it. Use the x button to close the list.

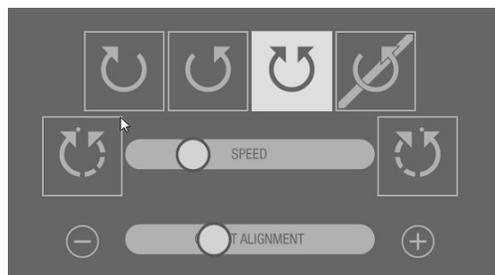


Presenter



Presenter contains the following functions:

- **Material:** Displays icons of the loaded materials. Press  to show materials in list view.
- **Scene (center screen):** Currently loaded scene with objects. The color indicates the material slots. Tap the list button to return to the scene list.
- **Material Slots:** Icons are shown below the scene and are used to assign materials to the respective objects.
- **Texture scale:** The top slider is used to change the texture size.
- **Texture rotation:** The bottom slider is used to change the rotation of the UV map size.
- **Illumination:** These buttons are used for switching between diffuse daylight D65, LED spot illumination, and switching off illumination.
- **Rendering:** The eye button is used to switch the eye-tracking feature on and off. The gamut button is used to turn on the **Out of Gamut** warning. Parts of the image which are out of gamut will flash red and white.
- **Rotation Stage:** These buttons are used for controlling the stage rotation. The left button rotates the physical sample clockwise and the virtual sample counterclockwise. The second button from the left rotates physical sample counterclockwise, the third button from the left starts the commute back and forth mode, and the fourth button from the left stops rotation. The buttons next to the speed slider define the commuting range.



- **Rotation direction:** The rotation direction button select the rotation mode of the virtual and the physical turntable.

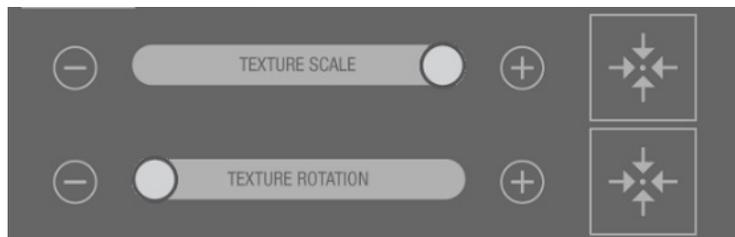
Physical and virtual turntable rotate in the opposite direction. This is the recommended default setting which is optimized for the correct illumination rendering.



Physical and virtual turntable rotate in the same direction.



- The sliders below the rotation stage buttons are used to adjust the rotation speed of the turn table and the virtual objects.
- The “Object Alignment” slider is used to align the virtual object on the turntable with the physical sample. Use the – and + buttons to fine tune the alignment.



- The sliders for texture scale and texture rotations are used to scale / rotate the UV maps on the scene object files. Use the two squares next to the sliders to return to the original settings of the UV map’s scale and rotation.

System Information

x-rite PANTONE® VIRTUAL LIGHT BOOTH

SETTINGS

INFORMATION

SYSTEM INFO

LEGAL

ERROR LOG

SERVICES

CALIBRATION

SETTINGS

PERSPECTIVE

PROFILING

STAND-BY

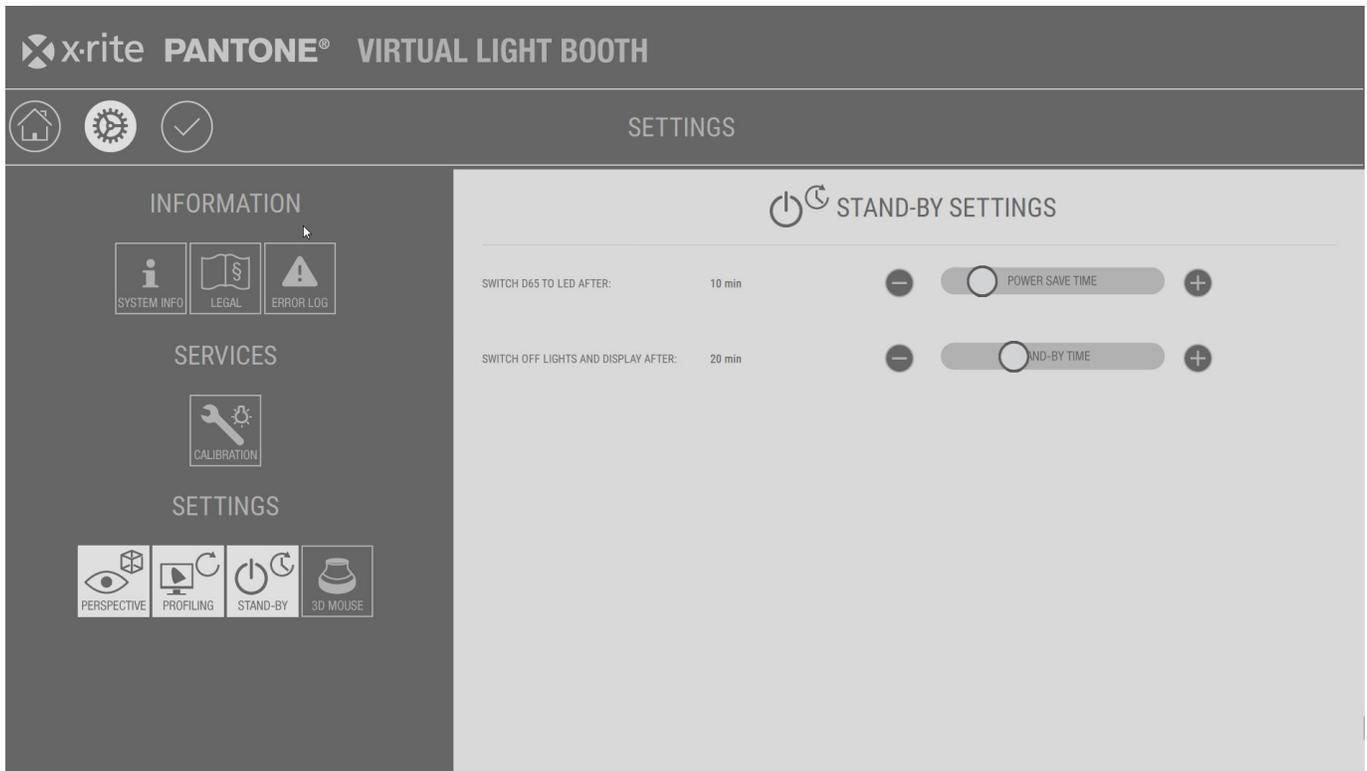
3D MOUSE

SYSINFO

SERIAL NUMBER:	10104
VLB SOFTWARE VERSION:	1.1.2.13630
SERVICE CALIBRATION:	28.08.2018
NEXT CALIBRATION DUE:	27.09.2018
D65 LAMP USAGE:	260.1 hours
LED LAMP USAGE:	n/a
IP ADDRESS:	192.168.0.228
SPLQC SERIAL NUMBER:	150705623
DISPLAY SERIAL NUMBER:	472LT6A6A90249
DISPLAY PROFILE DATE:	2018-01-22 11:32:47

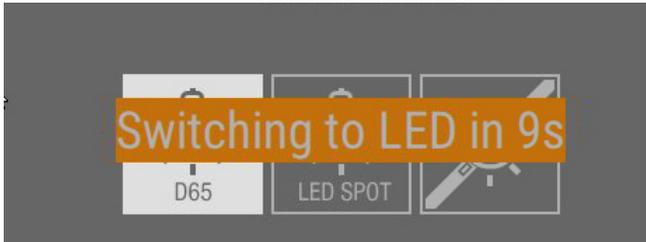
- **System Info:** Provides the user with all needed information about the VLB, for example firmware, calibration status, IP address and others.
- **Legal:** Acknowledgment of used 3rd Party Software.
- **Error Log:** Once the error symbol  appears in the main screen the VLB firmware displays detailed error information about the current problem in the section.

Settings



- **Head Tracking Settings:** There are two settings related to head tracking
 -  The one on the main screen switches the tracking on and off. Once the head tracking is activated, the user needs to raise his hand to become the currently tracked user. This is not necessary if the user is alone in front of the VLB.
 -  The one on the settings screen controls the perspective based on the viewer position.
 - When the tracking is on and the perspective is off, the VLB still corrects for the angular behavior of the display to guarantee better color reproduction.
 - Whenever somebody makes use of the VLB alone, they should run the head tracking. If the user does not like the changing perspective, then they can switch it off.

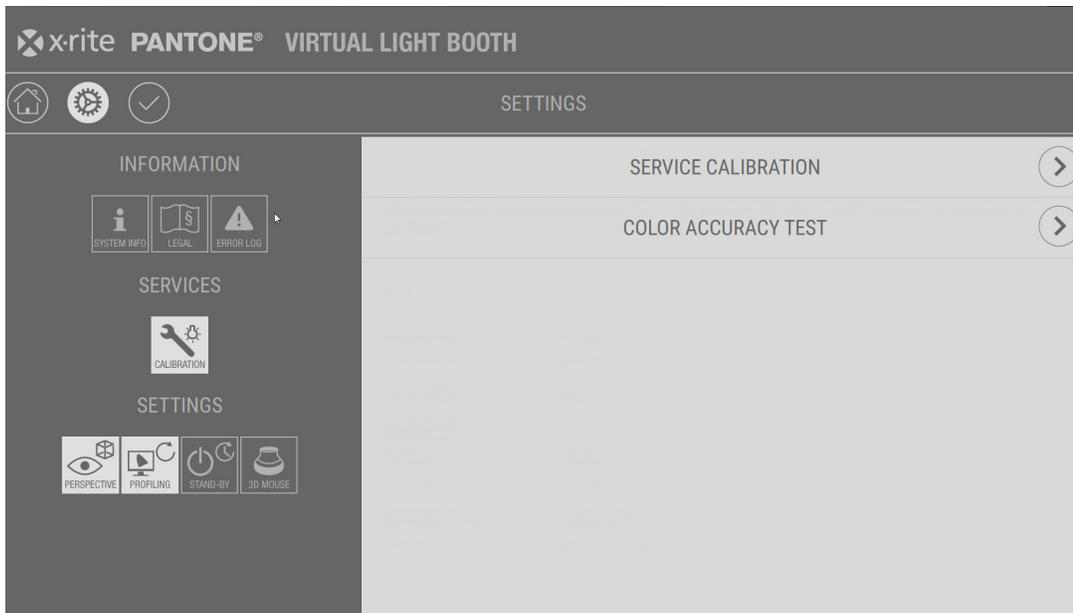
- Whenever using with multiple users, it doesn't make sense to switch on the tracking. Since the viewpoint-based display correction will only be sensible for the currently tracked person and lead to strange behavior for all others.
- **Stand-By Settings:** Set the time after the D65 diffuse light switches to LED illumination and after the display will be turned off automatically.
30 seconds before switching to the LED spot light a message appears with countdown time.



30 seconds before switching off the display a message appears with countdown time.

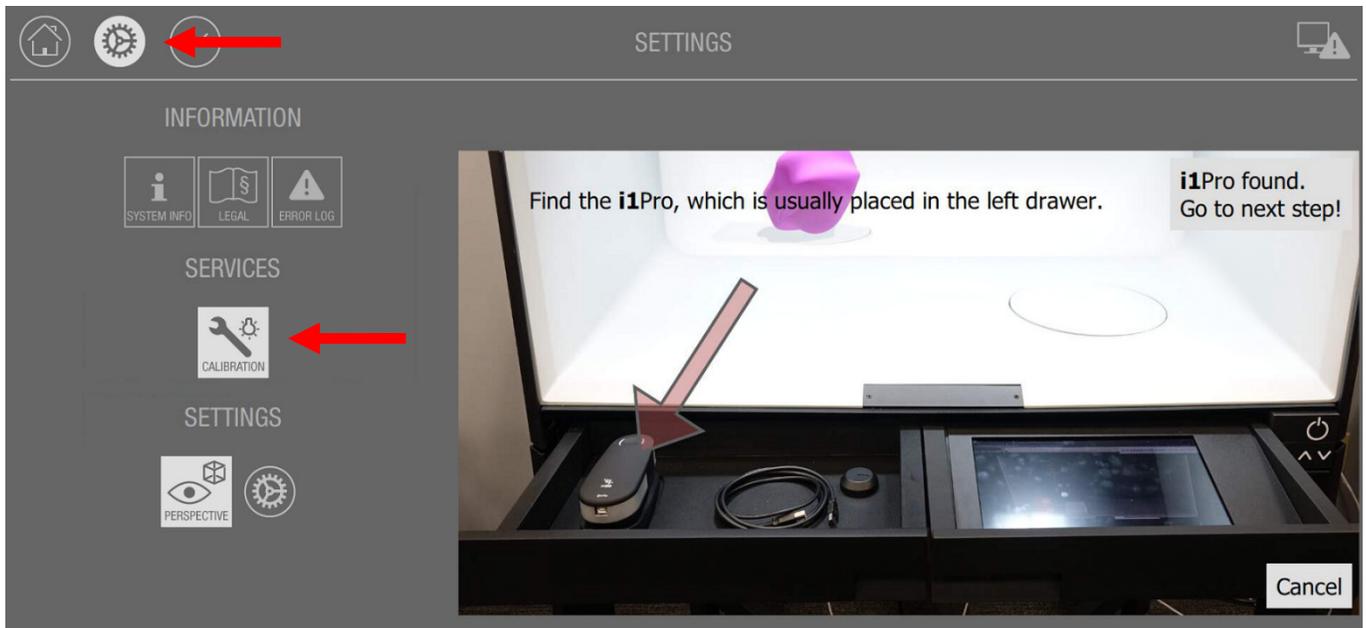


Light Calibration



The VLB lights are recalibrated using the i1Pro instrument that is stored in the front drawer. Refer below for the calibration procedure.

1. Tap the **Service** button on the Home screen of the touchpad to access the Settings screen.



2. Tap the **Calibration** button on the Settings screen to start the procedure.
3. Open the front left drawer on the VLB and connect one end of the USB cable into the i1Pro.



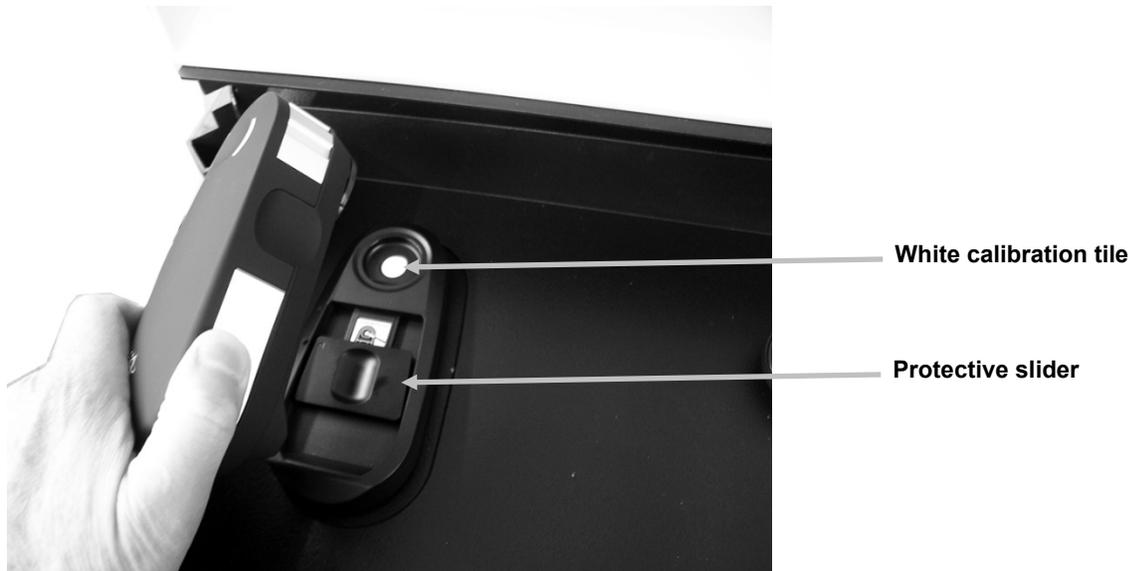
4. Plug the other end of the USB cable into the port on the front panel of the VLB.



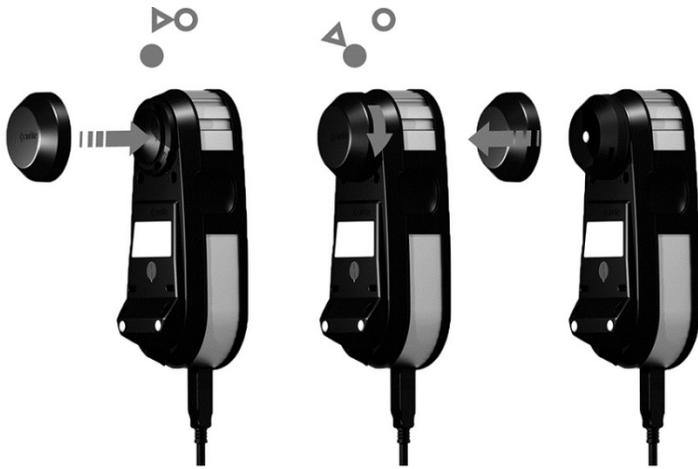
5. After the i1Pro is connected, tap the **Go to next step** button on the screen.
6. If attached, remove the protective cover with ambient light measuring head from the i1Pro. The arrow on the protective cover must point to the “O” unlock marking on the i1Pro before removing.



7. Open the protective slider on the calibration holder to access the white calibration tile.
8. Position the i1Pro in the calibration holder with the aperture over the white calibration tile.



9. After the i1Pro is positioned in the holder, tap the **Calibrate i1** button on the screen to perform a white calibration.
10. After white calibration is complete, remove the i1Pro from the holder and close the slider in the holder over the white tile.
11. Attach the ambient light measuring head on the limiting aperture of the i1Pro. The arrow on the protective cover must point to the “O” unlock marking on the i1Pro.
12. Rotate the protective cover with ambient light measuring head clockwise until the arrow points to the “●” locked marking on the i1Pro.
13. Pull the protective cover from the ambient light measuring head.



14. Align the i1Pro and the i1-stand in the center of the rotation stage (see below).



15. Locate the calibration curtain, fold and secure the two corners together using the hook and loop fasteners in the curtain.



16. Hang the calibration curtain on the VLB so that the entire front is covered.



17. Tap the **Take measurements** button on the screen. The VLB will perform a LED SPOT Measurement, D65 – Voltage Adjustment, and D65 Measurement.

NOTE: This process will take several minutes to complete.

18. After the measurements are completed, the VLB will perform a texture whitepoint adjustment.

19. After the adjustment is completed, a SUCCESS message will appear. Tap the **Return to Settings** button on the screen.

20. Tap the **Exit Setting** button on the Setting screen to return to the Home screen.

21. Remove the calibration curtain from the front of the VLB.

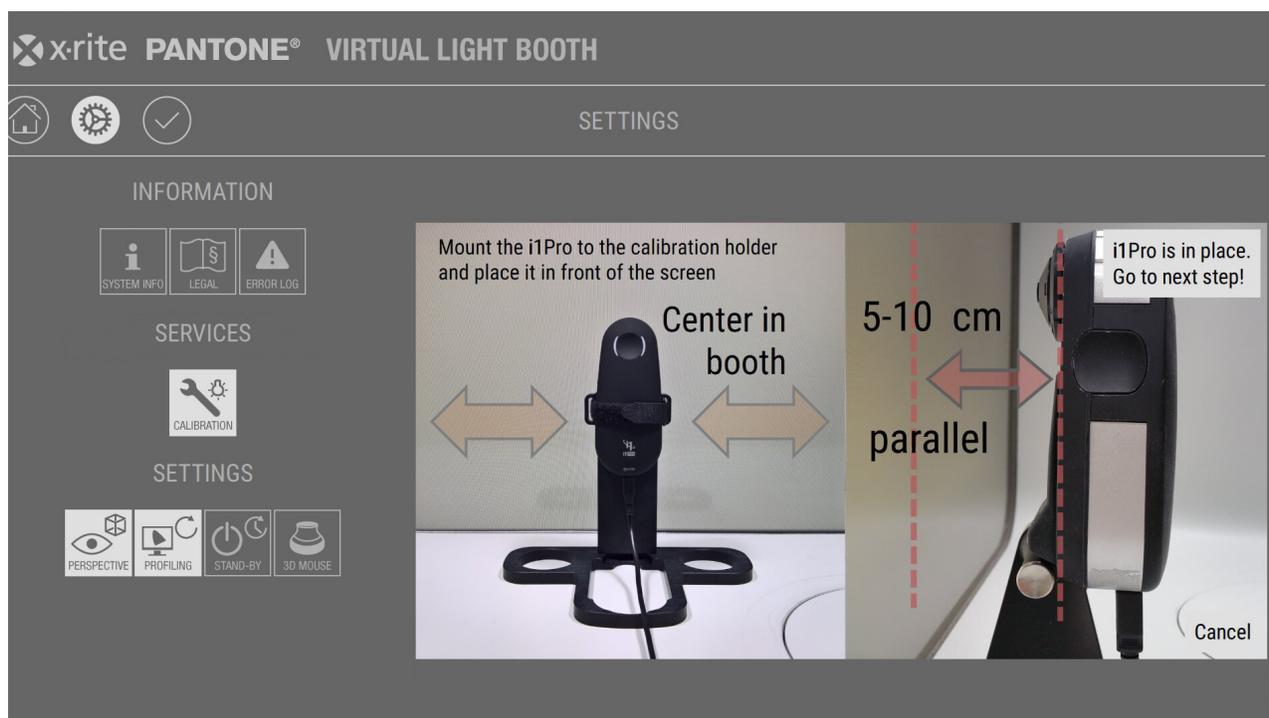
22. Remove the i1Pro from the rotation stage and unplug it from the front panel.

23. Reattach the protective cover to the i1Pro and return it back to the front left drawer next to the calibration holder.

COLOR ACCURACY TEST

To check if the color accuracy of the VLB display deviates from the original factory calibration you can perform a color accuracy test at any time. The procedure is similar to the light calibration.

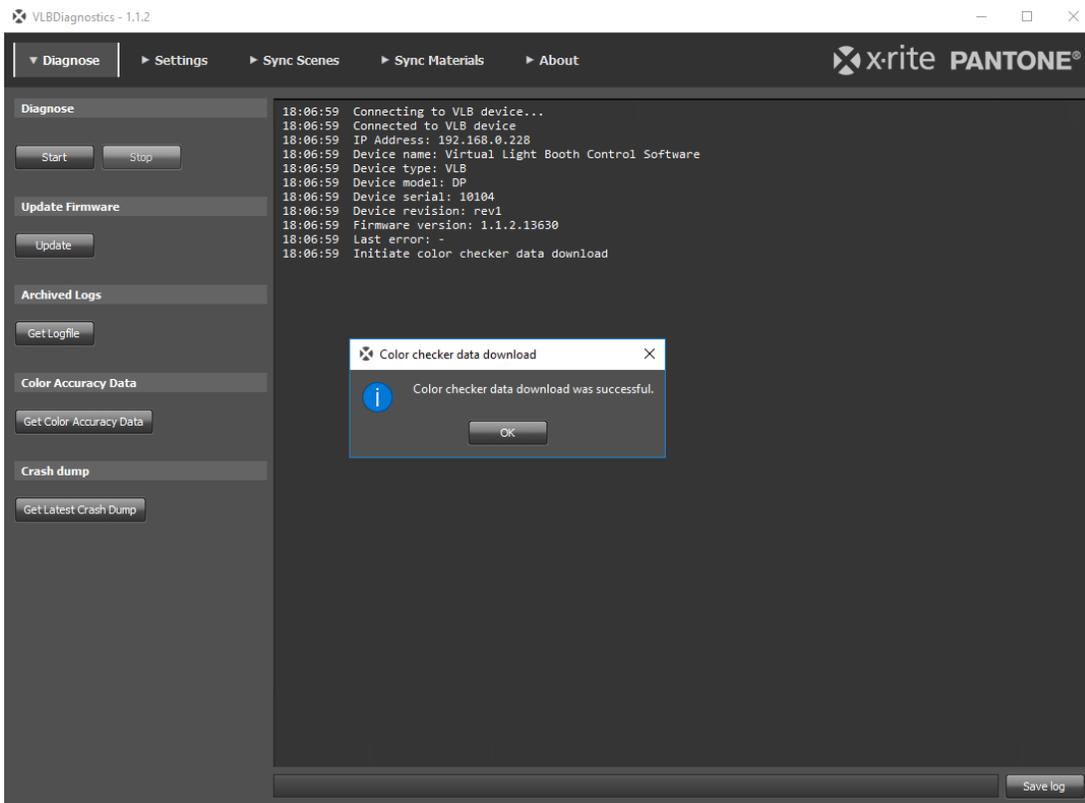
1. Tap the **Service** button on the Home screen of the touchpad to access the Settings screen.
2. Tap the **Calibration** button on the Settings screen to start the procedure.
3. Connect the i1Pro and perform the light calibration. Refer to the Light Calibration section for additional information.
4. After the light calibration, mount the i1Pro on the i1Pro calibration holder and place it in front of the monitor. Make sure that it is centered and is 5-10 cm from the front of the monitor.



5. Dim the room illumination for the usual viewing conditions. Do not install the calibration curtain or mount the ambient light head on the i1Pro.
6. Start the measurements by tapping the **Next Step** button.
7. A series of 24 patches of the ColorChecker is displayed on the monitor and measured with the i1Pro.
8. After the measurement the average delta E to the factory calibration is calculated and displayed.



9. You can download the color accuracy data using the VLB Diagnostics application for archiving or sending to X-Rite VLB support.



Supported External Devices

- **3D Mouse:** Starting with firmware version 1.1, the VLB supports the usage of a 3D connexion SpaceMouse to control the objects in the virtual VLB scene.
The following models are currently supported:
 - 3D connexion SpaceNavigator (P/N: 3DX-600036)
 - 3D connexion SpaceMouse Compact (P/N: 3DX-600053)

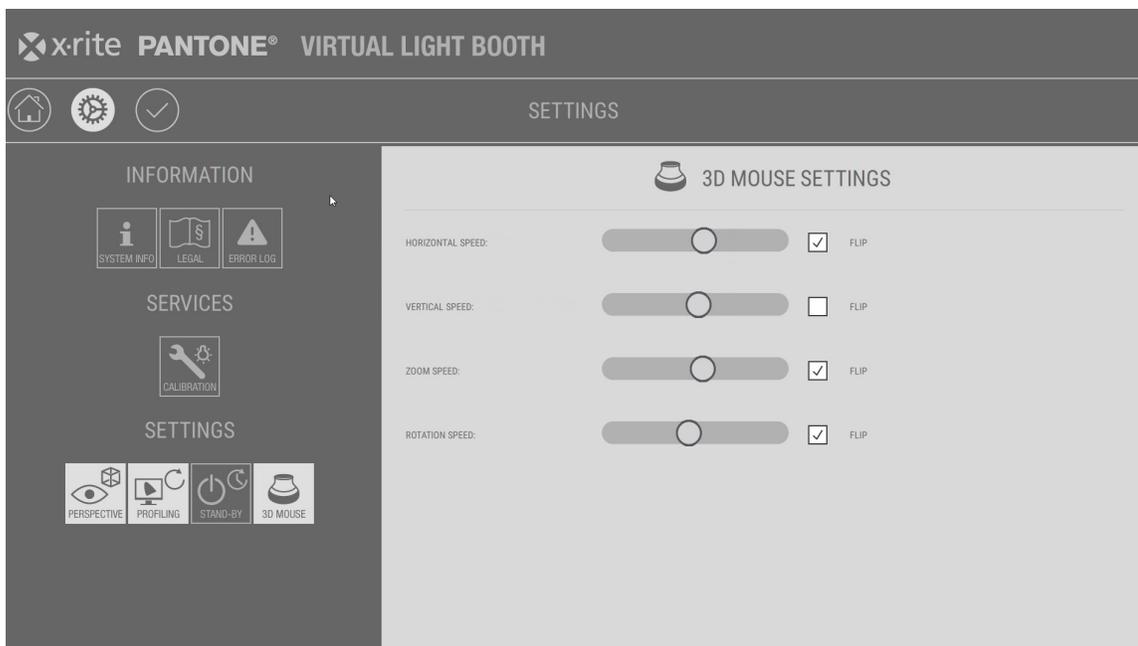


Basic Operations:

- Use the left 3D mouse button to release the 3D object from the turntable and navigate it inside the VLB scene
- Use the left 3D mouse button again to reset the object back on the turntable
- While using the 3D mouse other functions like rotating the object with the turntable are deactivated

When connecting the 3D mouse the blue light turns on. After it is connected the light turns off. The blue light will turn on again when the 3D mouse is in navigation mode.

The movement speed of the 3D mouse can be configured using the service settings. You can also flip the direction of the movement using the service settings.

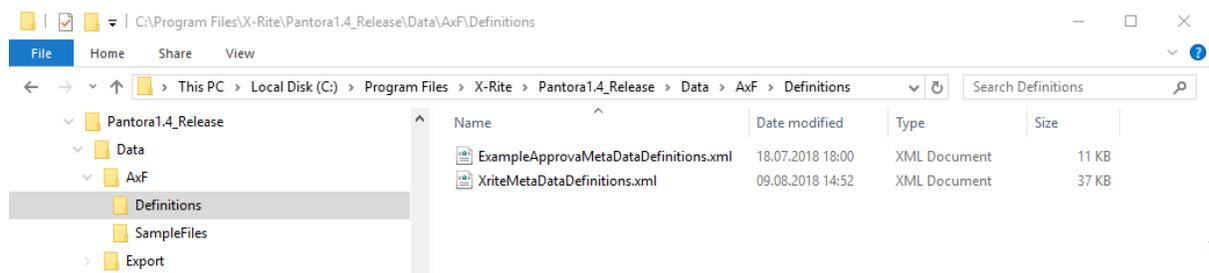


THE APPROVAL WORKFLOW IN VLB AND PANTORA

You can implement a fully customized workflow for approval using the VLB. It supports the generation of user defined controls and allows the application of some logics using JavaScript.

1. Setting Up the Approval Workflow in Pantora

When using the Approval workflow you must create an xml file that contains the defined controls and the JavaScript code. The xml file must be located in Pantora in the same folder as the **XriteMetaDataDefinitions.xml**: file. See below for location.



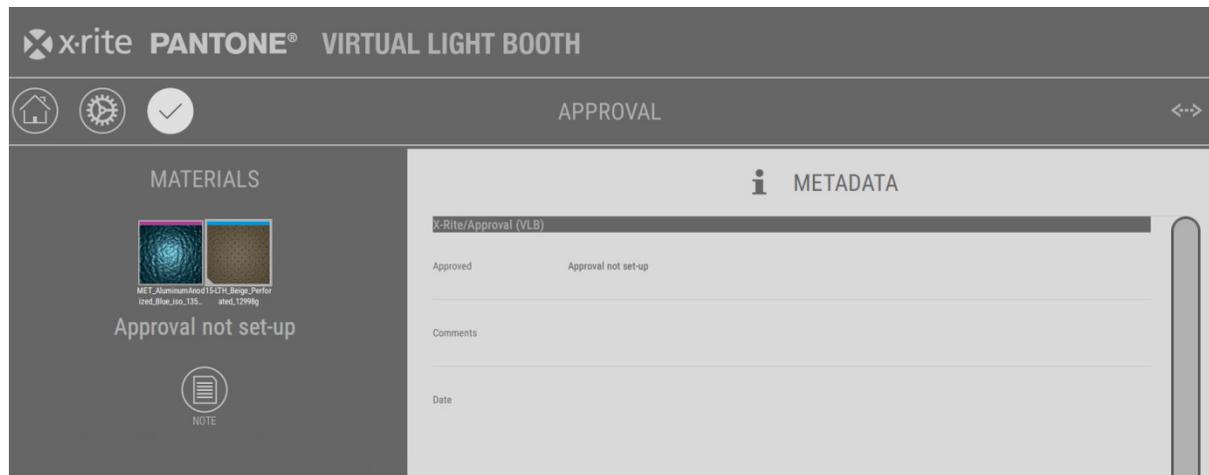
An **ExampleApprovaMetaDataDefinitions.xml** file is provided that creates the following Approval UI and workflow. You can edit the file and adapt it to your needs or create a new file and give it an appropriate name (name.xml). All screen images that follow are created using the **ExampleApprovaMetaDataDefinitions.xml** file.

You can also flag every other meta data field that you have defined in other XML files to get displayed on the VLB in the approval workflow. This is accomplished by adding the XML attribute **VLBApproval="True"** to the respective tag.

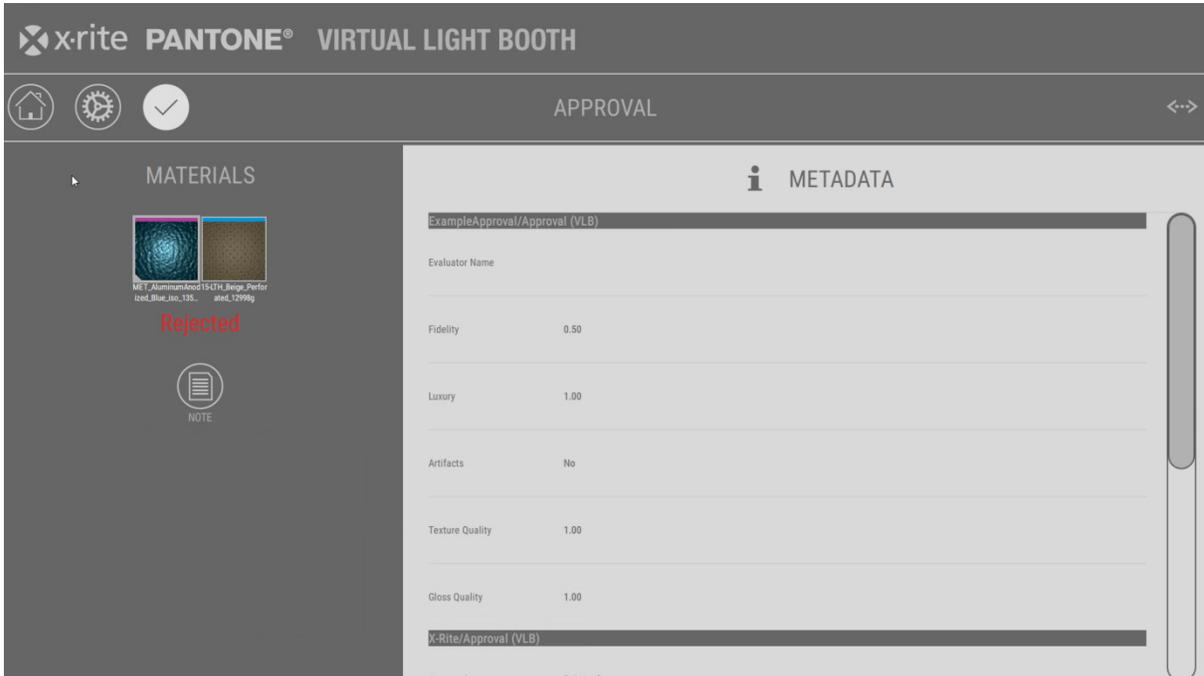
2. Using the Approval Workflow on VLB

Tap the Approval button  to access the Approval workflow screen.

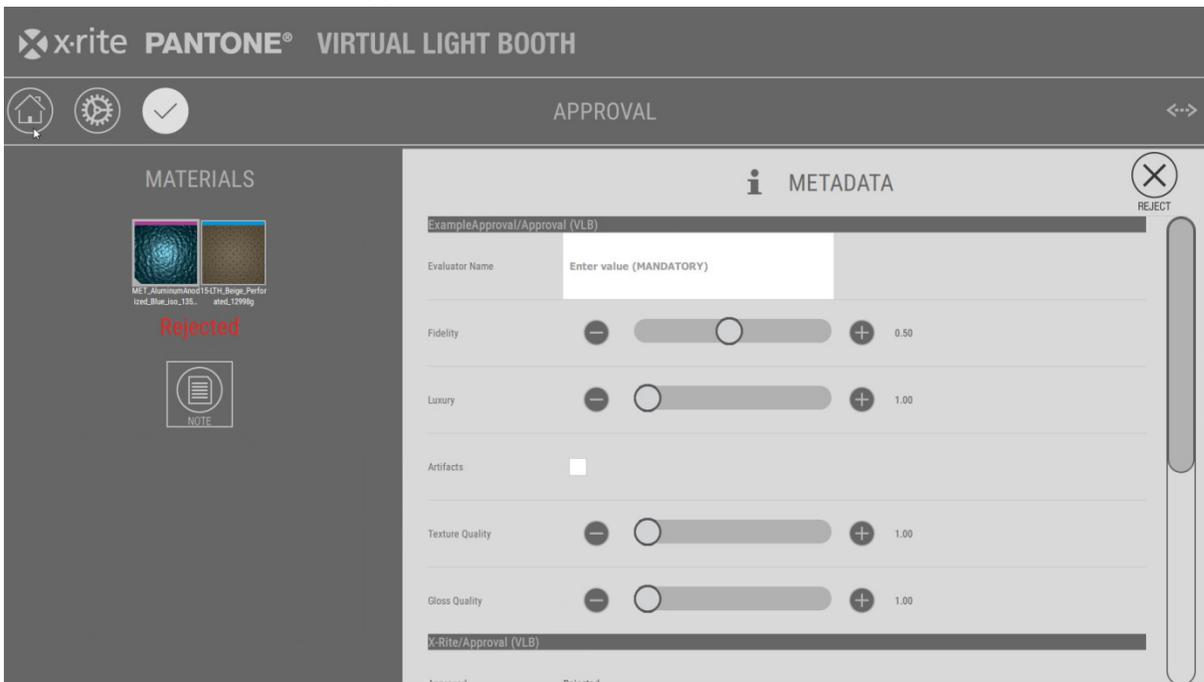
The materials which are currently loaded in the scene are selected for approval. If the setup is not ready you will see the following screen:



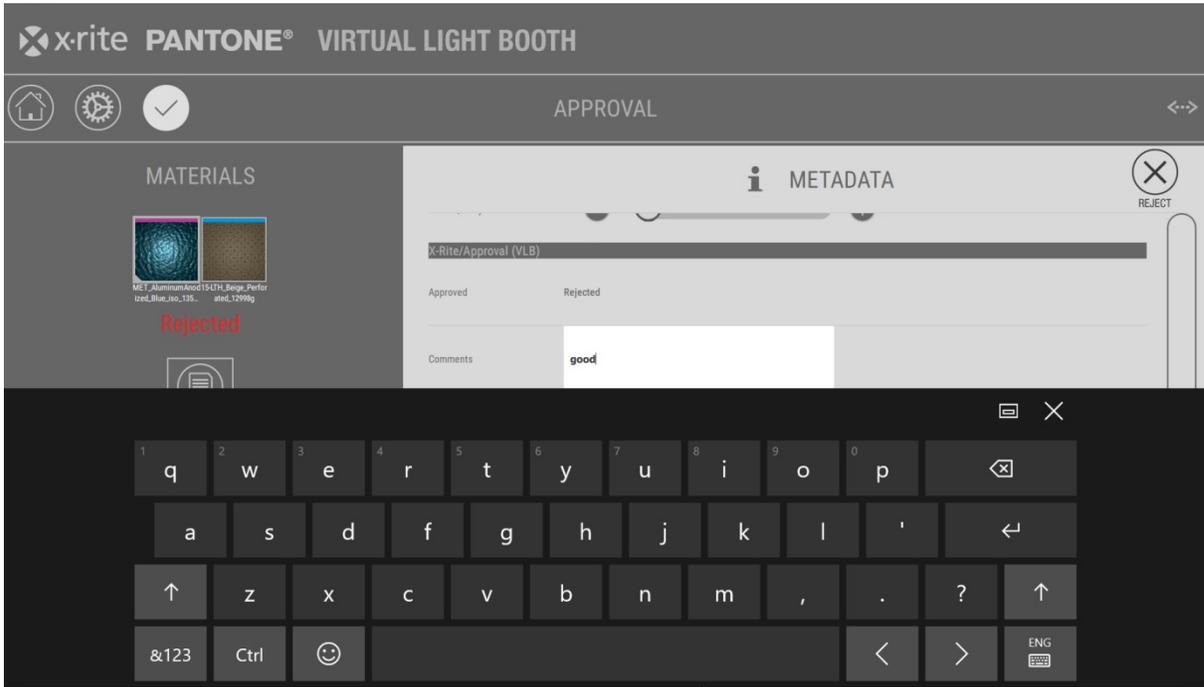
If the workflow is activated and the **ApprovalMetaDataDefinition.xml** is loaded in Pantora you will see a screen similar to the one below. A new unapproved material is shown as rejected and the defined properties have default values displayed.



Next select the material to approve and then tap the **NOTE** button to edit the metadata.

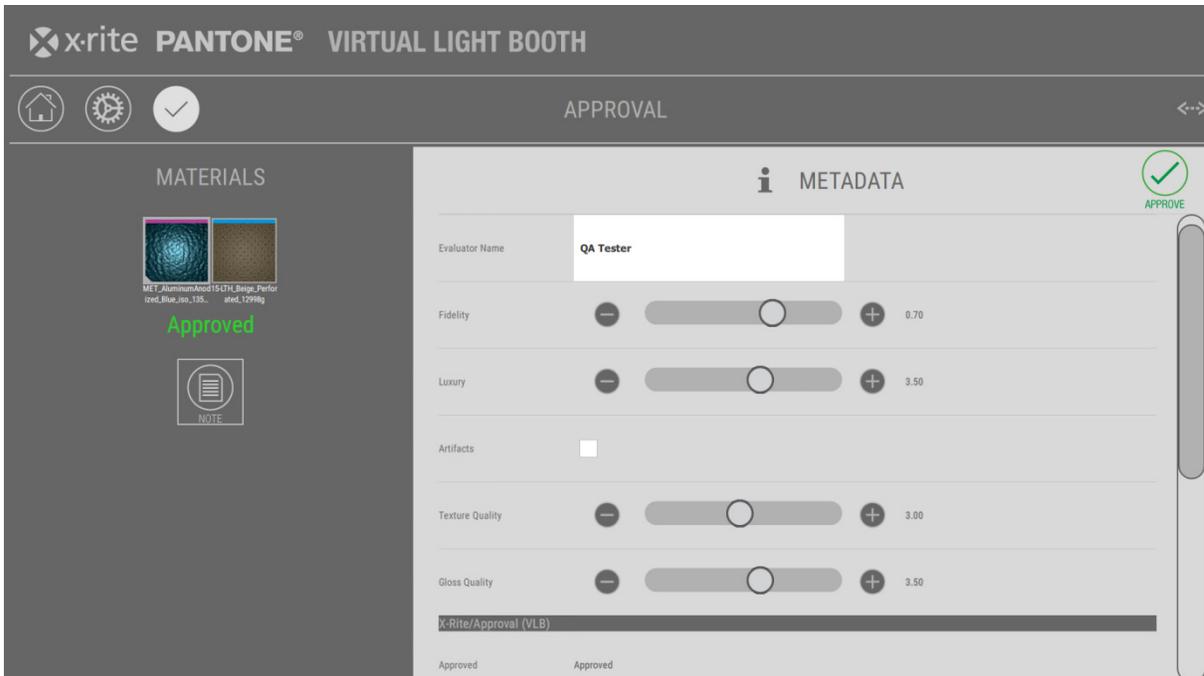


At a minimum you must enter the evaluator's name. Tap the blank field to open the virtual keyboard and enter the evaluator's name. The same procedure applies to the comments field.



After adjusting the properties a red **Reject** or green **Approve** button appears in the upper right corner.

If this button is tapped, the metadata is saved together with the approval status and date. The metadata is updated in the materials list and in Pantora.



3. Using JavaScript in the Approval Workflow

Using JavaScript you can customize the approval workflow in a very flexible way. It can be mapped to individual workflows (e.g. a multi-step approval process).

The general outline of the JavaScript process is as follows:

```

Item {
  function validateInputs(IApprovalFields) {
    ...
    return result;
  }
  function evaluateApproval(IApprovalFields) {
    ...
    return [state, message, color];
  }
}

```

You need to declare an item with two methods, `validateInputs` and `evaluateApproval`. Both receive a list of the metadata fields as defined in the definition XML files, including their current values. The ID of the field with index `i` can be accessed using `IApprovalFields[i].strFieldID` and the value using `IApprovalFields[i].value`. The field ID corresponds to the value of the ID attribute specified for the respective property in the definition XML.

The `validateInputs` needs to return true or false depending on whether the inputs of the user are viable at all. With this method you can model dependencies between different fields (e.g. if a certain box is checked, another comment field has to be filled by the user). If you return false here, the VLB software will not let the user save the entered data.

The `evaluateApproval` needs to return a 3-tuple of values. State should be an integer and can have three different values:

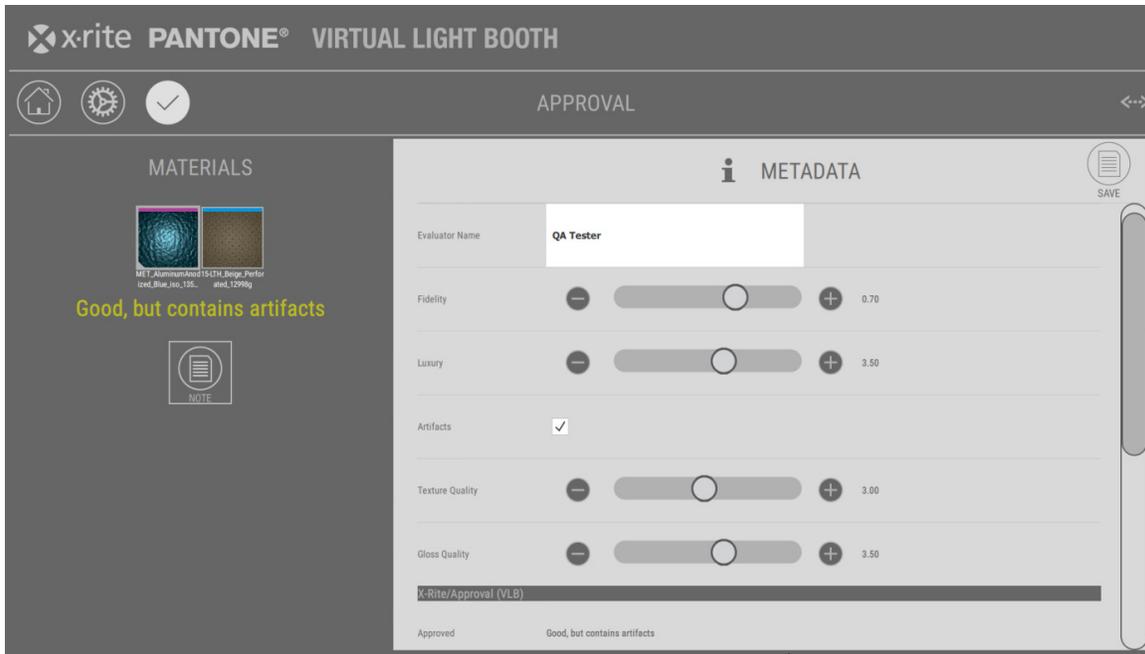
- **0**: not evaluated, evaluation not possible (e.g. the user has not entered sufficient data)
- **1**: approved
- **-1**: rejected
- **2**: custom state

In case the state is **2 / custom**, the other two members of the tuple come into play: **message** and **color**. The VLB will then display the given message with the given text color in the left panel of the approval UI. In case of the other states, the VLB software will disregard this information and display its default messages.

Before adding your own JavaScript to the XML, please ensure that you encode it correct. The best way to ensure this is to use a dedicated XML software editor.

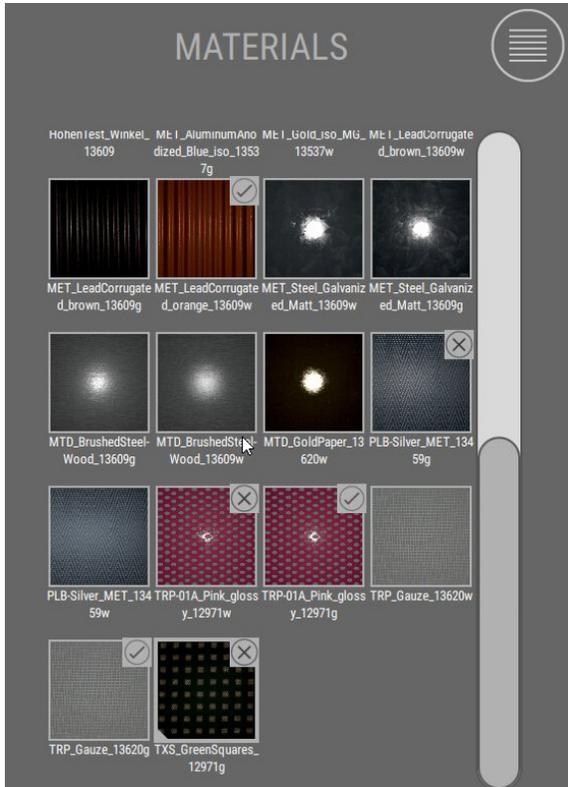
In the `ExampleApprovalMetaDataDefinitions.xml` an example script is supplied that shows all the features discussed above:

- The Approval status switches automatically from Rejected to Approved if certain thresholds are passed
- A special workflow is implemented if the quality is generally good but artifacts exist



4. Viewing and Handling of Approval Metadata

If a material finished the approval process it gets an approved  or rejected  mini-icon in the materials list.



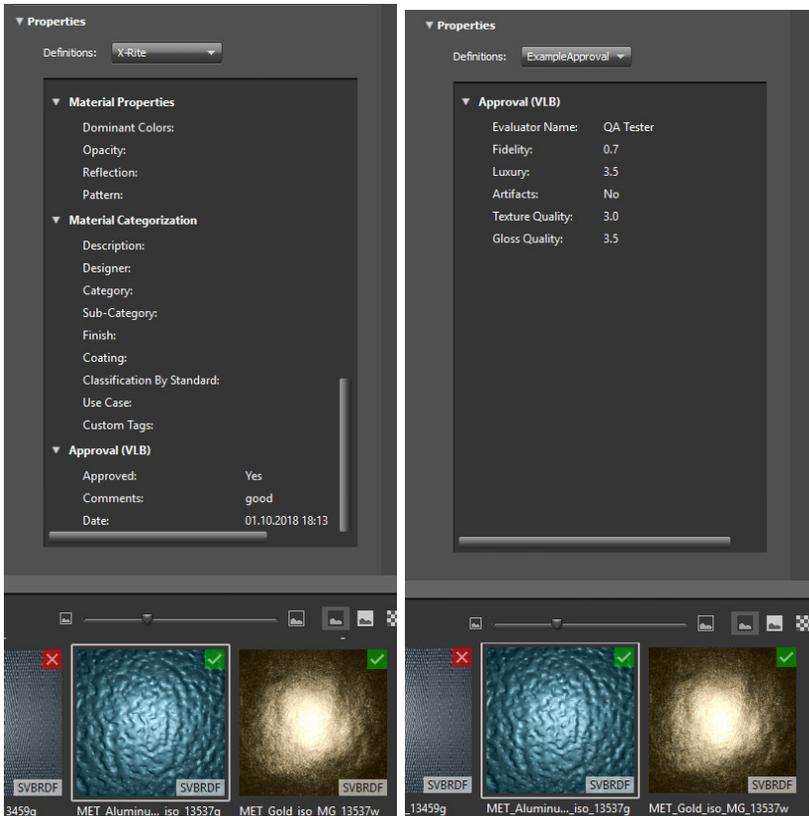
Loading an already approved material in VLB shows the approval status and all data including evaluator name, comments, and approval date.



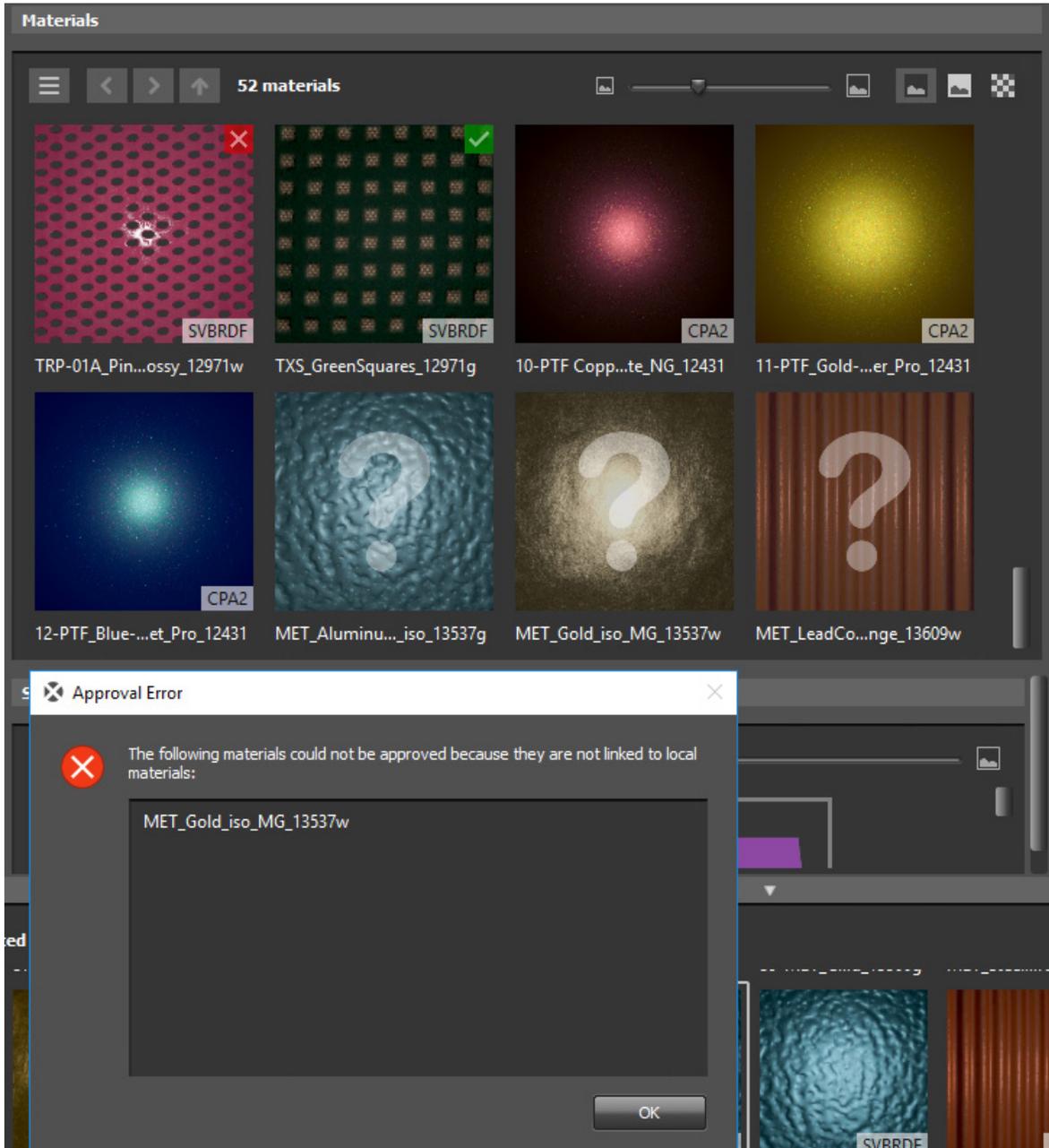
If Pantora is connected to the VLB all materials and metadata is synchronized immediately. This also allows you to see the metadata and mini-icons in Pantora.

If you select the X-Rite metadata definition the Approval (VLB) section contains status, comments, and date. The data is write protected in Pantora.

The approval metadata definitions contain the remaining values.



If the approved material is loaded on the VLB but not available on the computer currently running the connected Pantora instance, it cannot be updated and a warning message is displayed:



APPENDIX

Service Information

X-Rite provides repair service to their customers. Because of the complexity of the circuitry, all warranty and non warranty repairs should be referred to an authorized service center. For non warranty repairs, the customer shall pay shipping and repair cost to the authorized service center, and the device shall be submitted in the original crate, as a complete unaltered unit, along with all the supplied accessories.

X-Rite also offers on-site system support. Please contact your X-Rite representative for additional information.

X-Rite, Incorporated has offices around the world. You can contact us using one of the following methods:

- To identify the X-Rite service center nearest you, please visit our web site at: www.xrite.com and click the **Contact Us** link.
- For online help, visit our web site (www.xrite.com) and click the **Support** link. Here you can search for software or firmware updates, white papers, or frequently asked questions which can quickly resolve many common user problems.
- Send an e-mail to Technical Support detailing your problem and listing your contact information. For the Americas email CASupport@xrite.com, for Europe email EMEAtechsupport@xrite.com, for Asia email TechSupportAsiaDist@xrite.com.
- For sales questions or to order cables and accessories, visit our web site (www.xrite.com) or contact your nearest X-Rite dealer or service center.
- Problems and questions can also be faxed or emailed to your local X-Rite office listed on our website.

General Maintenance

Follow the procedures below for system cleaning, lamp replacements, and fuse replacement.

The VLB should be operated in an environment free of dust and other sources of contamination.



IMPORTANT:

Remove AC power from the VLB before performing any cleaning procedures.

CAUTION: DO NOT use any solvents to clean the VLB.

CAUTION: Use proper personal protective equipment (e.g., safety glasses) when using compressed air.

If compressed can air is used for any of the cleaning procedures that recommend air, do not invert or tilt the can during use. This could cause damage.



CAUTION: The daylight filters and lamps get very hot during normal operation. Do not touch the filters or lamps; allow time for them to cool before cleaning.

General Cleaning

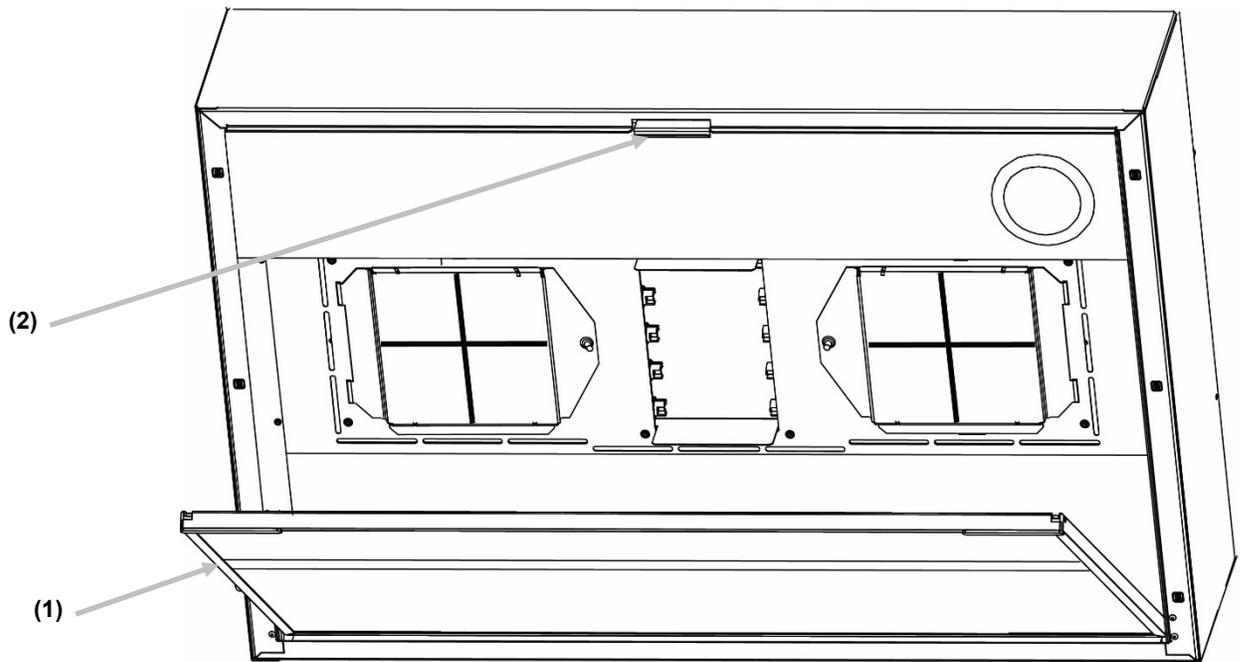
If necessary remove dust with a clean, lint-free cloth or clean dry air.

Diffuser Cleaning

1. Clean the exterior of the diffuser glass with a lint-free cloth.

 **CAUTION: Make sure there are no objects in the way of the diffuser before opening.**

2. Hold the diffuser (1) and release the diffuser latch (2) located at the front of the unit.
3. Slowly lower the front of the diffuser until it stops.
4. Clean the interior of the diffuser glass with a lint-free cloth.
5. Rotate the diffuser to its closed position and secure it in place with the latch.



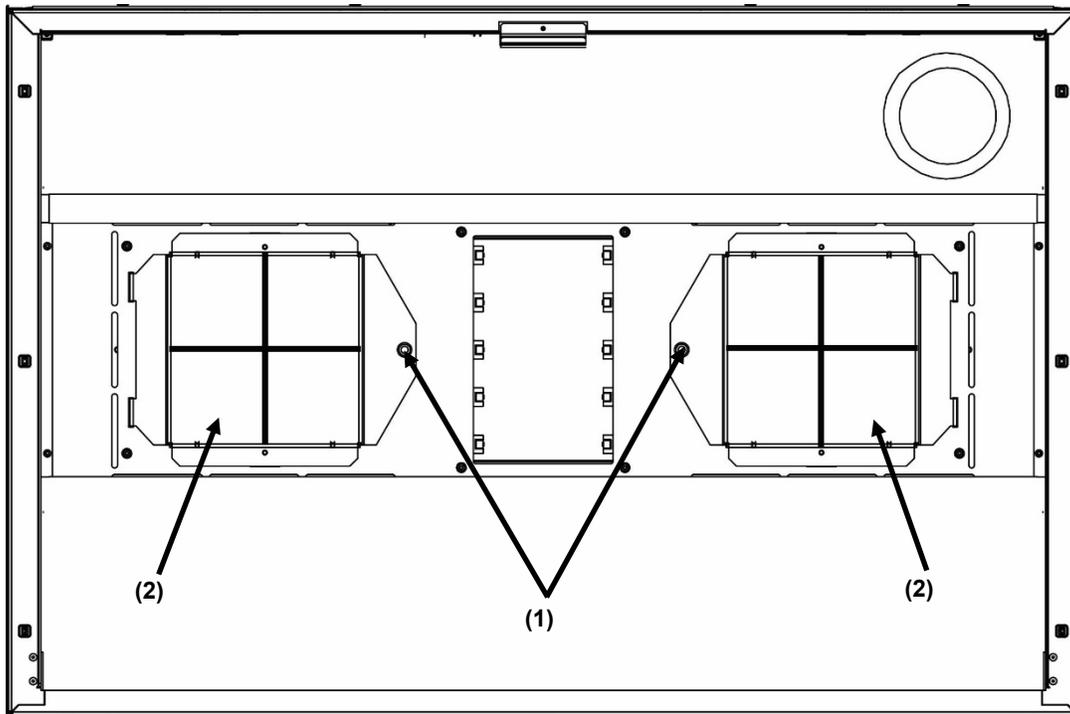
Daylight Filters Cleaning

1. Hold the diffuser and release the diffuser latch located at the front of the unit.
2. Slowly lower the front of the diffuser until it stops.



Allow time for the daylight filters to cool before handling them.

3. Holding the filter pack (1), push the fastener button (2) in and lower the daylight filter pack. Repeat the procedure for the other filter pack.



4. Remove dust from both sides of the filter pack with a clean, dry, lint-free cloth.
5. Remove dirt from the daylight lamp reflectors with a clean, lint-free cloth.
6. Rotate the daylight filter pack (2) back into position and push the fastener button (1) in to secure. Repeat procedure for other daylight filter pack.
7. Rotate the diffuser to its closed position and secure it in place with the latch.

Replacing the Lamps

Replace burned out lamps immediately in order to maintain the overall performance standards of the device. We recommend replacing lamps in complete sets.

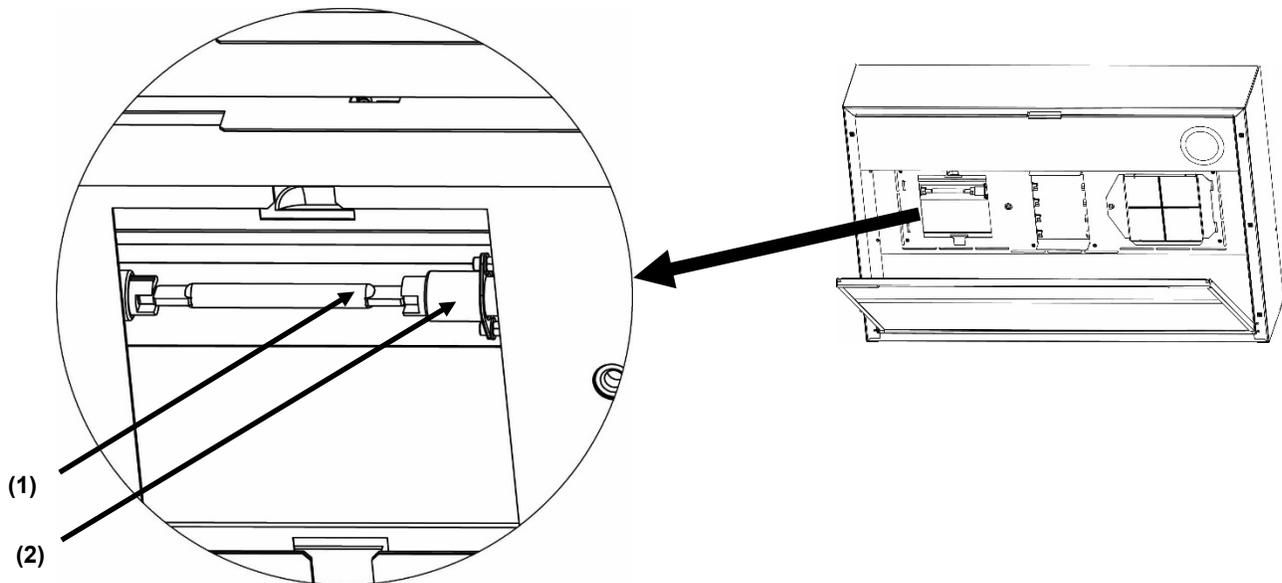
Lamp Type	Replace After
Simulated Daylight (DL)	400 hours or after 65,000 switching cycles.

1. Turn the main power switch off and unplug the AC line cord before proceeding.
2. Release the front diffuser latch. Slowly lower the front of the diffuser until it stops.



Allow time for the daylight filters to cool before handling them. Always use lens paper or equivalent when handling the lamps. Skin oils interfere with their performance.

3. Holding the filter pack, push the fastener button in and lower the daylight filter pack. Repeat the procedure for the other filter pack.
4. Push one end of the old lamp (1) into the spring loaded socket (2) with pressure to release the other end from its socket.



5. Lift the lamp clear of both sockets and discard in an appropriate receptacle.
6. Using a piece of lens paper (or equivalent) between your fingers and the lamp; push one end of the replacement lamp into the socket. Refer to the figure above.
7. Insert the other end of the lamp into the other socket and release the lamp.
8. Repeat step 3 through 7 for the other lamp.
9. Rotate the daylight filter pack back into position and push the fastener button in to secure. Repeat procedure for other daylight filter pack.
10. Rotate the diffuser to its closed position and secure it in place with the latch.

Troubleshooting

Prior to contacting the support department for device problems, try the applicable solution(s) described below. If the condition persists, contact us using one of the methods listed in the Service Information section.

Problem	Cause/Solution
VLB not responding	Unit is in power down mode. Press a switch on the front display panel.
	Unit is unplugged. Make sure the AC plug is connected.
	Contact X-Rite technical support.
Lamp not working	Lamp burned out or not installed properly. Refer to the Maintenance section for lamp replacement procedure.
	Contact X-Rite technical support.
Up and Down buttons not functioning.	The hydraulic controller that adjusts the VLB up/down has a maximum continuous operation cycle of two minutes before automatically shutting down for 18 minutes. Wait for 18 minutes to resume use.
VLB and PANTORA software not communicating.	Interface cable not connected.
	Connect the interface cable between the computer and the VLB.
	Close and restart the software application. If this does not work, reboot the computer.
	Turn the VLB off then turn the VLB on and see if the condition is corrected.

Technical Specifications

Dimensions:	Approx. 1810 mm H x 1160 mm W x 750 mm D
Weight:	180 kg
Illumination:	D65 diffuse illumination “SPLQC class” 6500K LED point light (for effect pigment evaluation)
Integrated Virtual Light Booth:	High Brightness Display 47”, 5000 cd/m ² X-Rite “Full Immersion Technology” (patent pending) <ul style="list-style-type: none"> Fully integrated display, dynamic real-time visualization, fully controlled and synchronized material appearance Synchronized sample position (real to virtual sample) Synchronized virtual light booth perspective (to observer position) and seamless “round edge” real-to-virtual transition
Render Engine:	X-Rite mview render engine <ul style="list-style-type: none"> Real-time engine based on OpenGL, optimized for rendering of virtual materials

Technical Specifications

	X-Rite Color Pipeline fully controlled, including <ul style="list-style-type: none">• 10 Bit-per-component color control, dynamic “observer position dependent” display profiling and real-time consideration of ambient light
Sensors & Controls:	Face Tracking sensors Ambient Light Tracking i1Pro2 sensor Luminaire (i1Pro2) and Display (i1D3) Consistency Control Sensors Rotation stage to rotate physical sample Hydraulic Height Adjustment to adapt to observer height
PC & Data Interface:	Embedded Workstation with pre-installed VLB software incl. full VLB calibration data Point-to-point Gigabit Ethernet connection to external PC running PANTORA software for exchange of virtual materials and virtual objects to evaluate materials
Product Safety Compliance	UL 60950-1, 2 nd Edition, 2014-10-14 (Information Technology Equipment – Safety – Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2 nd Edition, 2014-10 (Information Technology Equipment – Safety – Part 1: General Requirements) EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 (which includes all European national differences, including those specified in this test report). IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
EMC Compliance	FCC Part 15 IEC: 61000-6-1: <i>Generic standards – Immunity for residential, commercial and light-industrial environments</i> . Edition 2.0, issued March 2005. IEC 61000-6-3: <i>Generic standards – Emissions for residential, commercial, and light-industrial environments</i> .
Electrical Requirements	120 VAC, 12 A, 60Hz or 220-240 VAC, 7A, 50/60Hz
Operating Temperature	10° C to 30° C
Storage Temperature	-20° C to 55° C
Humidity	85%, non-condensing

Design and specifications subject to change without notice.



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