

CT2100 Paint Spectrophotometer



User Manual



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Important Notices

CE Declaration



Hereby, X-Rite, Incorporated, declares that this device is in compliance with the essential requirements and other relevant provisions of Directive(s) EMC 2014/30/EU, LVD 2014/35/EC, 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 B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

INDUSTRY CANADA COMPLIANCE STATEMENT

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

NOTE: USB interface cable shipped with this device must be used in order to maintain compliance with the desired CE mark requirements, FCC Part 15 Rules, and Canadian ICES-003.

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 instrument is not for use in explosive environments.

ADVERTENCIA: NO use este aparato en los ambientes explosivos.

AVVERTIMENTO: NON usare questo apparecchio in ambienti esplosivi.

WARNUNG: Das Gerät darf in einer explosiven Umgebung NICHT verwendet werden.

AVERTISSEMENT: Cet instrument ne doit pas être utilisé dans un environnement explosif.

If this product is used in a manner not specified by the instruction, the safety protection provided by the device may be impaired or become inoperable.



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

Warranty

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.

Package Contents

- CT2100 Device
- USB Cable
- Quick Start Guide

Device Overview

- (1) Status indicator
- (2) Sample arm with embedded calibration tile
- (3) USB connector port
- (4) Cable access opening



Installation

Before you can use your device or see its status, you need to install the software application on your computer. Please do not plug in the device's USB cable to your computer until after you have installed the software.

1. Install the software application from the flash drive onto your computer.
2. Review all instructions in this user manual before you start using your new device.
3. After you have completed the software installation process, attach your CT2100 device to your computer's USB port. If connected successfully the status indicator light up solid white.



The X-Rite CT2100 will not work if it is connected to the USB port on your keyboard or to a USB hub without external power supply.
CT2100 power rating: 5 V $\Rightarrow$ 500 mA.

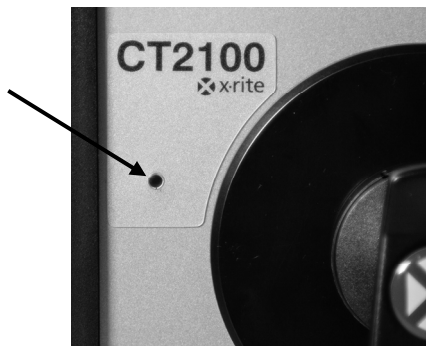


Device Status Indicators

The CT2100 device is equipped with a device status indicator on the front of the device in the device label. The location of the device status indicators is easy to monitor during operation. It provides feedback on the current status of the device and guides you through the measurement and calibration process.

General device status

Off	The device is not connected to a powered USB port on your computer. The device is in calibration mode.
Solid white	The device is connected to power/USB.
Pulsating white	The device is connected and ready for measurement.
Solid red	The calibration of the device failed due to a hardware problem.
Short green pulse	This indicates that the measurement was completed.



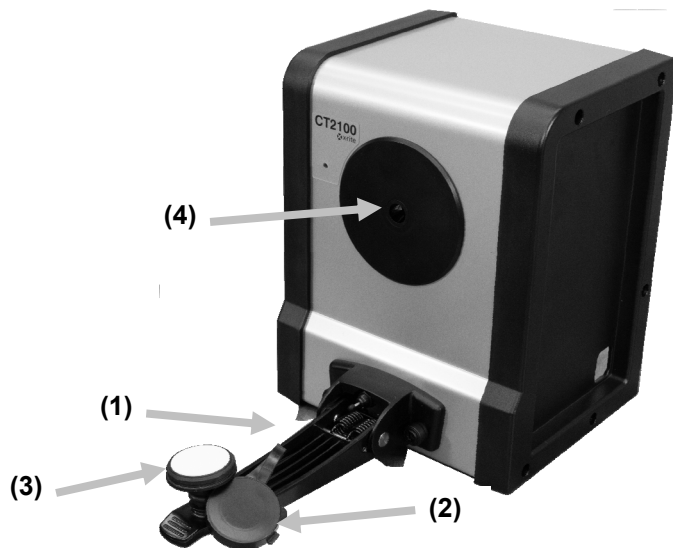
To avoid interference of the device status indicator with the measurement process, the device status indicator is turned off during measurement.

Device Calibration

The CT2100 minimizes daily maintenance with only one white calibration step. The embedded calibration tile is protected by a cap to reduce the risk of wet paint contamination.

White Calibration Procedure

1. Open the sample holder (1) completely.
2. Remove the cap (2) from the calibration tile (3).



3. Close the sample holder to the sample port (4).
4. Initiate the white calibration procedure from the software application.
5. **NOTE:** The status indicator is turned off during calibration.
6. When the calibration is finished, please re-attach the cap to the calibration tile.



NOTE: A clean white reference ceramic tile is essential for providing accuracy of your measurements. The cap should always be attached when the white reference ceramic tile is not in use. If necessary, you can clean the white reference ceramic tile with isopropyl alcohol and a soft clean cloth.

Taking Measurements

The CT2100 uses an LED light source and is able to take measurements in just a second. Make sure your device is calibrated and the status indicator is solid white before measuring. You should refer to the documentation for the software program that you are using with your instrument. All applications that use the instrument must be running during measurements.

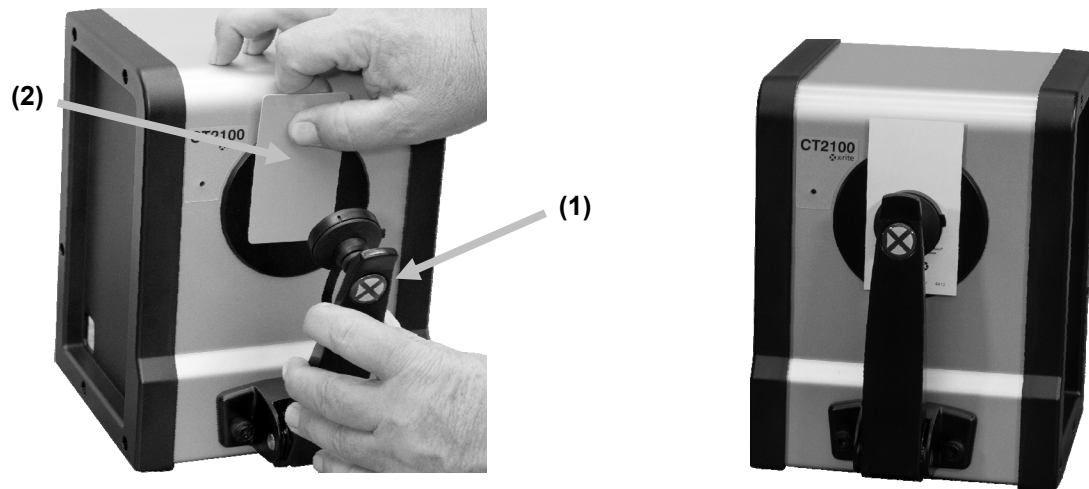
Sample Criteria

The instrument measures color data from just about any clean, dry surface that is reasonably flat and at least 12 mm in diameter. To ensure an accurate and reliable measurement, the sample should be held securely against the port in the sample holder.

NOTE: Never measure wet paint. Wet paint will contaminate the instrument.

Measurement Techniques

1. Clear the color sample surface of any dirt, dust, or moisture.
2. Pull the top portion of the sample holder (1) away from the device.



3. Place the sample (2) against the sample port. Make sure the sample side you wish to measure is facing the sample port.
4. Close the sample holder. You are now ready to measure the sample.
5. Initiate the measurement from the software application.

NOTE: The status indicator changes to red if the measurement was unsuccessful. Refer to the Troubleshooting section in the Appendices for more details.

Measuring Large or Oddly-Shaped Samples

When measuring large or oddly-shaped samples you can open the holder completely if necessary. The sample must be held securely against the sample port.

NOTE: The sample port is very sensitive to movement and light!

1. Clear the color sample surface of any dirt, dust, or moisture.
2. Pull the sample holder (1) down until fully extended.



3. Place the sample (2) against the sample port. Make sure the position does not interfere with the open sample holder.
4. Initiate the measurement from the software application.

5. When holding a sample for measurement yourself, remember to keep the sample perfectly still. Also, the sample surface should be able to rest completely flat against the sample port, preventing any light from entering the measurement area.

Appendix

General Maintenance

To maintain the measurement performance of your CT2100 over its lifetime, it is important to observe some rules and to periodically clean certain parts that are critical for measurement performance.

- The CT2100 device is sensitive to mechanical shocks. To avoid damage during transport the CT2100 must be always shipped in its original packaging.
- Do not store or operate the CT2100 device in dirty, greasy or dusty environments. Do not use the CT2100 in environments with temperatures higher than 35°C (95°F) or less than 10°C (50°F). Do not store the CT2100 in environments with temperatures higher than 50°C (122°F) or less than -10°C (14°F). The housing of the device may be cleaned using a cloth dampened in water with a soap solution if necessary.
- Keep the white reference ceramic tile clean at all times. You can clean the white reference ceramic tile with isopropyl alcohol on a soft clean cloth if required.

Service Information

The instrument is covered by a one-year limited warranty and should be referred to an authorized service center for repairs within the warranty period.

X-Rite provides repair service to their customers. Because of the complexity of the circuitry, all repairs should be referred to an authorized service center.

X-Rite will repair any instrument past warranty. The customer shall pay shipping and repair cost to the authorized service center, and the instrument shall be submitted in the original carton, as a complete unaltered unit, along with all the supplied accessories.

Technical Support contact number

Tel: 800-572-4626

Specifications

Spectral engine:	CT2100: i1 [®] technology (holographic diffraction grating with 128 pixel diode array) with built-in wavelengths check
Spectral range:	380 - 730 nm
Physical sampling interval:	3.5 nm
Optical resolution:	10 nm
Spectral reporting:	380 nm ... 730 nm in 10 nm steps
Optics:	Measurement geometry: 45°/0° ring illumination optics, ISO 13655:2017
	Measurement aperture: 8 mm (0.31") diameter
	Illumination spot size: 12 mm (0.47")
	Light source: CT2100 LED Illumination (including UV)
Reflectance measurement:	Spectral reflectance [dimensionless]
	Calibration: Manual on external ceramic white reference
	Minimal patch size in spot mode (Width x Height): 12 x 12 mm (0.47" x 0.47")
	Inter-Instrument-agreement: 0.4 ΔE_{00}^* average, 1.0 ΔE_{00}^* max. (deviation from X-Rite manufacturing standard at a temperature of 23°C (73.4°F) on 12 BCRA tiles (D50, 2°))
	Short-term repeatability: 0.1 ΔE_{94}^* on white (D50, 2°, mean of 10 measurements every 3 s on white)
Interface:	USB 1.1
Power Supply:	Device powered by USB. No additional charger or battery required. USB 1.1 high power device.
Operating Conditions:	Temperature: 10°C (50°F) – 35°C (95°F)
	Humidity: 0% – 80% non-condensing
Physical Dimensions:	CT2100: Depth 20.3 cm, width 18.3 cm, height 23.4 cm (8.0" D x 7.2" W x 9.2" H)

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Please visit www.xrite.com for a local office near you.

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