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Manual
X-Rite i1 Pro 2 Color Meters

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Contents

1 Important Notices 3
2 Specification 4
2.1 Technical specifications 4
2.2 Package Contents 5
3 System description 5
3.1 Device Overview 5
3.2 Device Status Indicators 6
4 Operation 7
4.1 Installation 7
4.2 Calibrating the device 8
4.3 Measurement 8
5 General Maintenance 12
5.1 Troubleshooting 13
6 Contact 14
6.1 PCE Instruments UK 14
6.2 PCE Americas 14

1 Important Notices

CE Declaration
Manufacturer's Name: X-Rite, Incorporated

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.
- Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules

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 (2.0 m) 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.

SAFETY INFORMATION

EQUIPMENT INFORMATION

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

This equipment is intended for use only with UL listed ITE equipment.

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

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.

2 Specification

2.1 Technical specifications

Spectral engine:	i1® technology (holographic diffraction grating with 128 pixel diode array)
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
Measurement frequency in scanning mode:	200 measurements per second
Optics:	
Measurement geometry:	45º/0º ring illumination optics, ISO 13655:2009
Measurement aperture:	4.5 mm (0.18”) diameter (effective measurement aperture during scanning is depending on the patch size and measurement speed)
Illumination spot size:	3.5 mm (0.14”)
Light source:	Gas filled Tungsten (illuminant type A)
Reflectance measurement:	spectral reflectance [dimensionless]
Measurement condition:	UV excluded Filter - ISO 13655:2009 measurement condition M2
:	:
Calibration:	Manual on external ceramic white reference
Measurement background:	white, ISO 13655:2009; for measurements on backup board
Maximal media thickness:	3 mm (0.12”) on backup board
Minimal patch size in scanning mode:	10 x 10 mm (0.39” x 0.39”) (Width x Height)
Inter-Instrument-Agreement:	0.4 ΔE94* average, 1.0 ΔE94* max. (deviation from X-Rite manufacturing standard at a temperature of 23ºC (73.4ºF) on 12 BCRA tiles (D50, 2º))
Short-term repeatability:	0.1 ΔE94* on white (D50,2°, mean of 10 measurements every 3 s on white)
Emission measurement:	spectral radiance [mW/nm/m2/sr], luminance [cd/m2]
Measurement range:	0.2 - 1200 cd/m2 on a typical LCD-Monitor
Short-term repeatability:	x,y ±0.002 typ. (5000 K, 80 cd/m2)
Ambient light measurement:	spectral irradiance [mW/nm/m2], illuminance [lux] cosine corrected diffusor light measurement head
Interface:	USB 1.1

2.2 Package Contents

1. Carrying case
2. Certificate of Performance
3. Display Holder
4. Positioning Target
5. Calibration Plate
6. Backup Board
7. USB Cable
8. i1 Pro Measurement Device
9. Ruler
10. User Manual
11. Application DVD

3 System description

3.1 Device Overview

1. Limiting Aperture
2. Measurement Button
3. Status Indicators
4. Type Label with Serial Number
5. Reference Gab for Ruler Mount
6. Mounting Interface for Accessories
7. USB Connector

3.2 Device Status Indicators

The i1Pro device is equipped with two device status indicators on its top housing. The device status indicators provide feedback on the current status of the device and guide you through the measurement process.
General device status:

( ) off	The device is either not connected to your computer, the software is not running, or the latest software to control the device is not installed on your computer. In the third case, the device can still be used in compatibility mode with software supporting older revisions of the **i1**Pro device.
:( ): solid white	The device is connected but needs calibration.
:( ): pulsating white	The device is connected and ready for measurement.
:( ): solid red	The calibration of the device failed due to a hardware problem (see troubleshooting section for further information).

To avoid interference of the device status indicators with the measurement process, the device status indicators are switched off during measurement.

4 Operation

4.1 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 from the DVD.

1. Install the software application from the DVD onto your PC or Macintosh® computer.

2. Review all instructions in this Quick Start Guide before you start using your new device. For more detailed information, please refer to Contents on the software DVD.

3. Remove the “Install software and read manual before first use” warning sticker from the device.

4. After you have completed the software installation process, attach your **i1**Pro device to your computer‘s USB port. If connected successfully both status indicators light up solid white.

The X-Rite **i1**Pro will not work if it is connected to the USB port on your keyboard or to a USB hub without external power supply.
i1Pro power rating: 5 V 500 mA.

Minimal System Requirements

Macintosh®
Intel® CPU, Mac OS X 10.5.8, 10.6.8 or 10.7 (with latest upgrades installed), 1 GB of available RAM, 2 GB of available hard disk space, monitor resolution of 1024 x 600 pixels or higher, powered USB port, DVD drive or high speed internet connection to download, install and update the software. Dual display support requires either 2 video cards or a dual head video card that supports dual video LUTs being loaded. User must have Administrator rights to install and uninstall the application.

Windows®
Intel® Pentium® 4 or AMD Athlon XP™ or better CPU, Microsoft® Windows® XP®, Windows Vista®, Windows 7® (all 32 or 64-bit and with latest service packs installed), 1 GB of available RAM, 2 GB of available hard disk space, monitor resolution of 1024 x 600 pixels or higher, powered USB port, network adaptor installed and driver loaded, DVD drive or high speed internet connection to download, install and update the software. Dual display support requires either 2 video cards or a dual head video card that supports dual video LUTs being loaded. User must have Administrator rights to install and uninstall the application.

Important note
The X-Rite i1Pro instrument can be used with older versions of the i1Pro software development kit (SDK) which were developed for older revisions of the i1Pro. In this case the new i1Pro operates in a downwards compatibility mode as an ISO 13655 measurement mode M2 (UVcut Filter) device and new functions like the status indicator lights won‘t be operational. To make use of the complete functionality of this instrument check with your software supplier if newer versions of your software with the latest SDK are available.

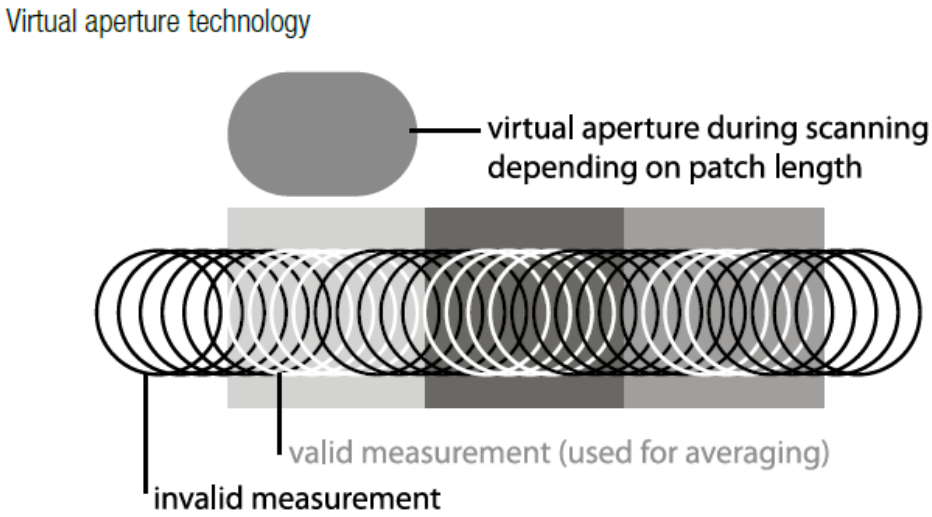
4.2 Calibrating the device

Before you start measuring, please calibrate the device. If you own multiple devices make sure that the serial number on the back of the calibration plate matches the serial number of your **i1**Pro device. Refer to the user guide of your measurement software for additional information on the calibration process.

1. In the center of the calibration plate is a slider to protect the white calibration tile. Open this protective slider until it clicks into place to access the white reference ceramic tile on this calibration plate.
2. Place the **i1**Pro measurement device on the calibration plate. The device must seat firmly on the calibration plate.
3. Set the software for calibration of the device and press the measurement button. Status indicator lights switch off during calibration. Once the device is successfully calibrated the status indicator lights pulsate white. If the calibration fails the status indicator lights will pulsate red and then return to solid white.
4. When the calibration is finished you should close the protective slider for the white reference ceramic tile.

A clean white reference ceramic tile is essential for providing accuracy of your measurements. The protection cover should always be closed 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.

4.3 Measurement



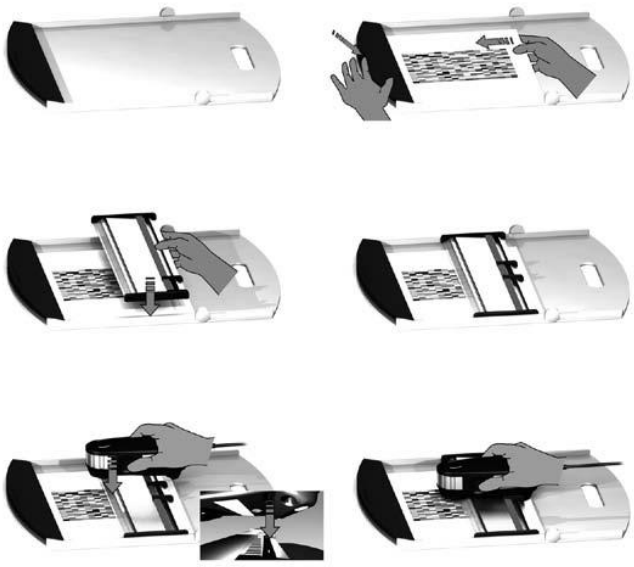
During a scan measurement the **i1**Pro device is performing 200 measurements per second. The automatic patch detection of the device identifies useable measurements made on a patch and unusable measurements made between two patches. Valid measurements on a patch are averaged and the device reports the averaged result to the software. Thanks to this technology the virtual aperture of the **i1**Pro device adapts to the length of a patch. For best measurement results the length of the patches on your test chart should be selected based on the resolution of your printer. For printers with lower resolution or a grainy screening you should increase the length of the patches on your test chart.

Measurement conditions

The **i1**Pro measurement device is equipped with a fixed UVcut filter and supports only a single measurement condition.

Single Pass Measurement is required for measurement condition
- ISO 13655 M2 | Illumination with UV excluded (UVcut)

The :( ): Status Indicators on the **i1**Pro device guides you through the measurement process.

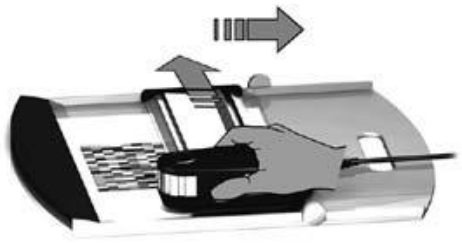


To prepare your **i1**Pro device for a scan measurement you need to mount the i1Pro device on the ruler. Make sure your device is calibrated and the status indicators are pulsating white before you mount it.

1. Unfold the backup board.
2. Use the clamp to secure the test chart on the backup board.
3. Place the ruler on the backup board.
4. Position the **i1**Pro device in the carriage on the ruler. Make sure that the positioning pins on the carriage slide into the reference gaps on the bottom of the **i1**Pro device. Double-check that the **i1**Pro device seats firmly in the carriage.
5. During scanning measurement make sure that the device's limiting aperture glides smoothly on the guide rail of the ruler.

The distance between the **i1**Pro device and the surface of the printing substrate is critical for the accuracy of your measurements. If the limiting aperture of the device or the edge of the ruler's guide rail is worn out you should replace them. Spare parts can be ordered through X-Rite's Service Centers.

Single Pass Scan Measurement



1. Make sure that your device is calibrated and the status indicators are pulsating white.

2. Position the ruler with the device on the white paper in front of row #1 of your test chart. It does not matter if you scan the row from left to right or right to left.

3. Set your software to single scanning mode.

4. Press the measurement button on the device and wait one second before you start moving the device to the opposite site on the ruler. Hold the measurement button pressed until you have reached the far end of your test chart. The short delay before the measurement process is required to warm up the tungsten filament lamp. The status indicators on the device provides feedback if the measurement was successful:

2x green flash	the row was measured successfully.
2x red flash	the row was not measured successfully because not all patches could be recognized. Measure the row again, but reduce your measurement speed and make sure that the device starts and ends the measurement before and after the patches of the test chart.
4x red flash	the row was not measured successfully because you started reading the patches too early without giving the tungsten filament lamp enough time to warm up. Measure the row again but allow the lamp time to heat up before you start moving the **i1**Pro device.
1x green; 2x red flash	the row was measured successfully but the software expected the measurement of a different row. Check if the row you measured is the row the software is expecting.

5. Position the ruler with the device in front of the next row of your test chart and measure the next row.

Spot Measurement

To prepare your **i1**Pro device for spot measurement you need to mount the **i1**Pro device on the positioning target. Make sure your device is calibrated and the status indicators are pulsating white before you mount it. Refer to the user guide of your measurement software for further details on the spot measurement process.

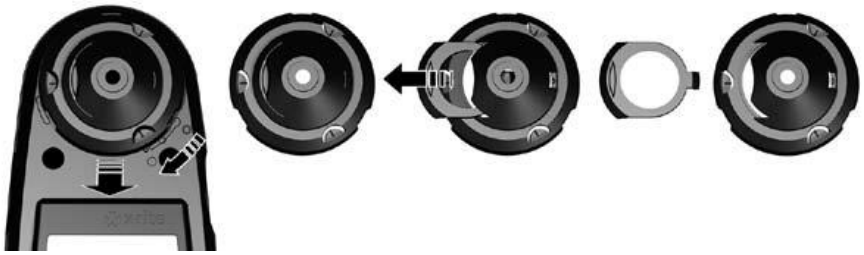
1. Mount the **i1**Pro measurement device on the positioning target by inserting the mounting connector on the positioning target in the mounting interface at the rear of the **i1**Pro device.
2. Configure your software to take spot measurements.
3. Position the device on the patch you would like to measure.
4. Press the measurement button on the device. Status indicator lights switch off during a measurement and pulsate green once the measurement has been successfully finished.
5. To remove the **i1**Pro device from the positioning target, gently pull the mounting connector with the positioning target out of the mounting interface at the rear of the **i1**Pro device.

Display Measurement

To prepare your **i1**Pro device for a display measurement you need to mount the **i1**Pro device on the display holder. Make sure your device is calibrated and the status indicators are pulsating white before you mount it.

1. You can adjust the length of the counter weight of the display holder for the size of your screen. The counter weight is equipped with hook-and-loop fasteners on both ends which allow you to shorten and lengthen the display holder to the correct length.
2. Mount the **i1**Pro measurement device on the display holder by inserting the mounting connector on the display holder in the mounting interface at the rear of the **i1**Pro device. Make sure that the nose of the **i1**Pro device seats firmly in the display holder.
3. Fix the **i1**Pro measurement device in the middle of your screen.
4. Set the software for display measurement and start the measurement process in the application. Status indicator lights switch off during measurement.
5. To remove the **i1**Pro device from the display holder, gently pull the mounting connector with the display holder out of the mounting interface at the rear of the **i1**Pro device.

5 General Maintenance



To maintain the measurement performance of your **i1**Pro over its life time, it is important to observe some rules and to periodically clean certain parts that are critical for measurement performance.

- The i1Pro device is sensitive to mechanical shocks. To avoid damage during transport the **i1**Pro must be always shipped in its original packaging.

- Do not store or operate the **i1**Pro device in dirty, greasy or dusty environments. Do not use the **i1**Pro in environments with temperatures higher than 35°C (95ºF) or less than 10°C (50ºF). Do not store the **i1**Pro in environments with temperatures higher than 50°C (122ºF) or less than -10°C (14ºF).The plastic housing of the device may be cleaned using a cloth dampened in water with a soap solution if necessary.

- The protection glass in the limiting aperture of the **i1**Pro device may become dusty after some time. You can remove the protective glass to clean it and the inside of the limiting aperture:

    1. To remove the limiting aperture turn it clockwise until the arrow points to the “unlocked” position on the **i1**Pro device.

    2. Remove the limiting aperture from the device. Avoid touching the optics.

    3. Slide the slider with the protection glass out of the limiting aperture.

    4. Clean the protection glass and the inside of the limiting aperture with isopropyl alcohol on a soft clean cloth.

    5. Re-assemble the limiting aperture with the protection glass slider. Make sure that the slider snaps back into its original position.

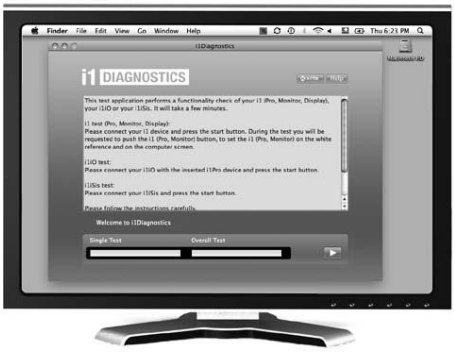
    6. Mount the limiting aperture back on the device with the arrow pointing at the “unlocked” position on the **i1**Pro device.

    7. To lock the limiting aperture turn it counter-clockwise until the arrow points to the “locked” position on the **i1**Pro device.

- 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.

5.1 Troubleshooting

Diagnostic Software



Use the **i1**Diagnostics software if you believe your **i1**Pro is not functioning properly.

In this case please perform the following steps:

1. Launch **i1**Diagnostics Software.
2. Perform a functionality check by following the instructions given from the **i1**Diagnostics Software.
3. If **i1**Diagnostics software reports an error store the test report and contact our Support Center.

6 Contact

If you have any questions about our range of products or measuring instruments please contact PCE Instruments.

6.1 PCE Instruments UK

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