Scopes
Visualizing Skin and Hair

Visual evaluation brings esthetic counseling beyond the point of merely sensing surface conditions. The skin's appearance and features can be captured and visually compared, providing information that no quantitative results can provide. Brightness, pigmentation, and texture of the skin as well as skin and hair damage can be visually evaluated.

Applications

Skin Texture

Texture is the unevenness or smoothness of the skin that is evident in peaks and valleys. Evaluating the texture plays a very important role in skin counseling. It is achieved by white light image based skin analysis. A digital camera combined with different lighting techniques can be used to visualize and subsequently analyze either a local area or the full face for a number of features including the following:

• Cellular Surface Pattern

The basic texture measurement is accomplished with white light. Evaluating the surface pattern of the peaks and valleys dividing the skin into tiny segments, homogeneity of the skin surface pattern can be determined.

• Lines and Wrinkles

Natural aging due to collagen loss accelerated by sun damage and other extrinsic factors increases the amount of fine lines and severity of deep furrows on the skin's surface. Also imaged with white light, shape and depth of lines can be used to determine the degree of aging.

• Pores

Pores are the outlets of the sweat and sebaceous glands of the skin. Depending on the level of sebum production, the pores can be visibly enlarged. Clear, unclogged pores appear smaller, while pores that are clogged or blocked seem larger. Evaluating pore size and shape gives an indication of skin condition for future treatments.

• Keratin (Cell turnover, Squames, Dead Cells, Flakiness)

The skin's corneal layer has a natural, consistent cell turnover cycle of approximately 28 days. The turnover rate as well as size and shape of keratin cells are an indicator of the skin's flakiness and condition. By means of an adhesive tape, loose keratin cells are removed from the corneal layer and evaluated based on size, shape, and count of dead cells.

Pigmentation (Blotchiness, Age spots)

The genetically determined intrinsic degree of pigmentation can be influenced by external factors like free radicals and UV light causing sun damage and spots, which can accelerate the normal aging process. This can influence the degree and distribution of melanin in the skin resulting in uneven pigmentation such as age spots. Visible, later stage pigmentation can be seen under polarized light and early stage, barely visible spots can be seen best with UV light.

i-Scope with Windows PC

i-Scope with Android Tablet

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Analyzing Methods

White Light Illumination

Surface structures as well as properties of skin can be made visible through bright field illumination utilizing broad-spectrum LEDs which emit light from roughly 450 nm to 700 nm.

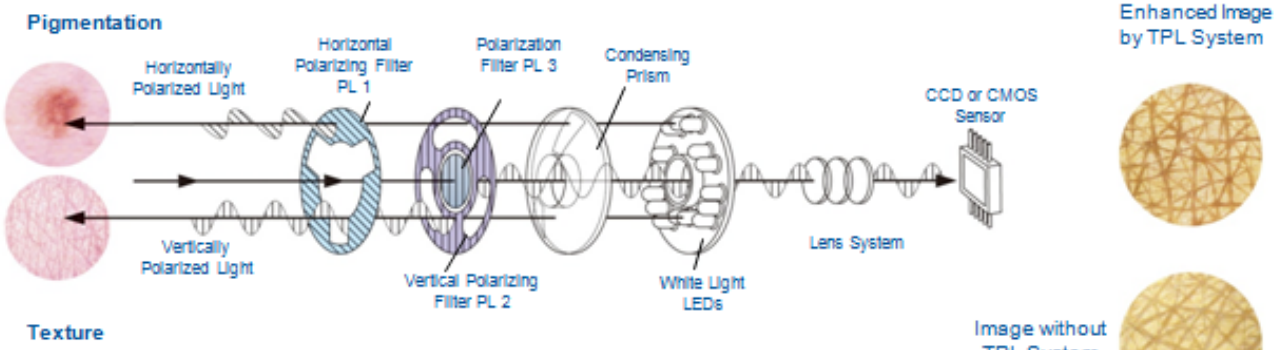
White Light Skin Image (30x Mag)

Illumination with UV Light

Illumination with UV-light , sometimes referred to as "black light", is a method that enhances certain features by the effect of fluorescence excitation with wavelength below 400 nm. Hidden, emerging pigmentation as well as sebum and ports can be made visible since they fluoresce and emit light of a longer wavelength thus appearing to "glow".

Polarized Light Skin Texture and Pigmentation Analysis

The MORITEX patented Triple Polarizing Technology* ("TPL") method utilizes the white light of an i-Scope with 30x or 50x magnification lenses with integrated polarizing filters. The TPL method reduces the amount of glare causing light reflected from the skin surface enhancing a clearer, more precise image for skin texture and pigmentation analysis, depending on mode settings.



*Japan patent # 4053653 registered on Dec 14, 2007
US patent #6118476 registered on Sep 1, 2000

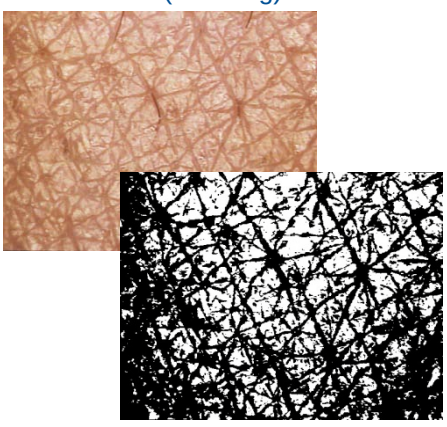
Areas with visible pigmentation will be enhanced by horizontally polarized lighting passing through PL1 while images of skin texture will be improved by vertically polarized light passing through filter PL2. Light reflected from the skin will pass through the third filter PL3 which eliminates any directly reflected light to enhance image contrast at the CCD or CMOS sensor. Easy switching between both scope modes enables fast results.

Skin Optical Image Evaluation for Customized Software Solutions

Moritex customized software solutions enable optical image evaluation for the skin based on the image processing of a magnified digital image of an area of the skin, scalp, or hair. The result is a set of characteristics or calculated parameters related to the image:

- Pores: Shape - Round vs Oval, Pore or hair count
- Texture: Size and shape of the area between furrows and hills
- Pigmentation: Size and shape of affected area
- Wrinkles: Shape, length and depth

Skin Optical Image Evaluation (50x Mag)



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i-Scope USB 2.0

This scope is equipped with a 1.3 mega pixel CMOS sensor that when matched with our high-magnification lenses provides high-resolution imaging. To illuminate the skin for imaging, white LEDs are integrated into the housing of the sensor. The scope also features high-uniformity lighting and color accuracy as a result of each scope being calibrated to ensure even illumination and color balance. The USB 2.0 cable enables direct connection to a PC. The i-Scope viewer software included allows for real-time imaging, image capture, and storage with annotation.

Specifications

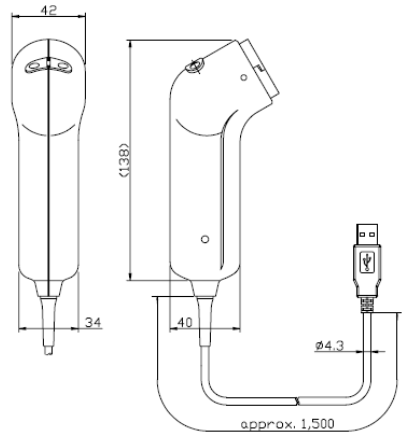
Analyzing Methods	Optical Image Processing with Advanced Illumination
Sensor	1/3 inch CMOS Sensor (1280 x 1024 pixels)
Magnification	Interchangeable Lens System (Sold Separately) White Light: 50x, 120x, 200x, 700x TPL: 30x PL, 50x PL
Illumination	• Broad-Spectrum White LED Illumination • Switchable Polarized Illumination* (* for 30xPL and 50x PL lens)
Power Supply	USB Power Supply Voltage: + 5V; Max. Current 500mA
Interface/Connector	USB 2.0 Compatible
Dimensions:	Housing: 42 x 40 x 138 mm (W x H x L) Cable: ∅ 4.3 mm, Length: 1500 mm
Weight	160 g (Excluding Cable)
Operating Conditions	Temperature: 5° C - 40 ° C Rel. Humidity: 35% - 85% (Non-Condensing)

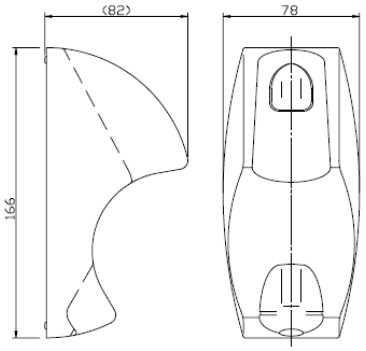
PC Hardware Requirements

The use of the i-Scope Viewer requires a PC or Notebook with the following minimum requirements:

• CPU: Pentium 4 / 1GHz or faster, Memory: 512 MB or larger

OS: Windows 7 , Windows 8 Desktop mode, Android OS Ver. 3.2 or later



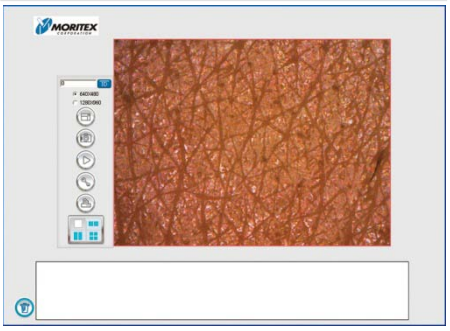


All dimensions in mm

i-Scope Viewer Windows

The included i-Scope Viewer software features the following functions:

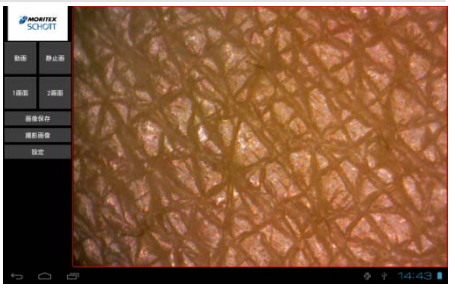
- Easy comparison of up to four side-by-side images within the viewer .
- Adjustable screen size & resolution between 640 x 480 and 1280 x 960 pixels
- ID registration to administrate & annotate client images
- Storage of images for future



Android Viewer

Able to download for free.

- Easy to comparison of up to two side-by-side images within viewer.
- Live/Freeze image
- Storage of image
- Gallery function to show saved image in thumbnail



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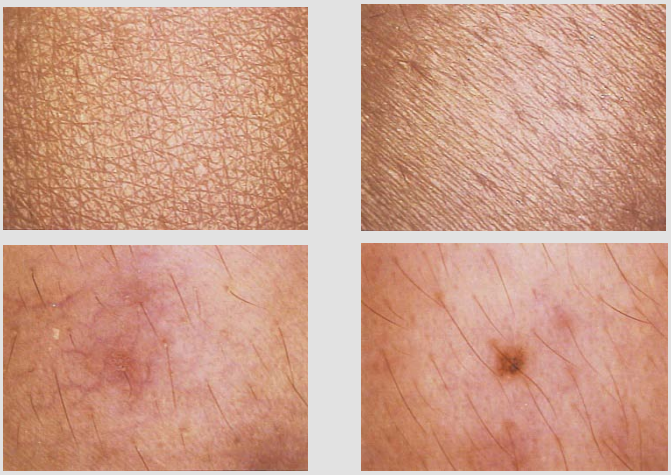
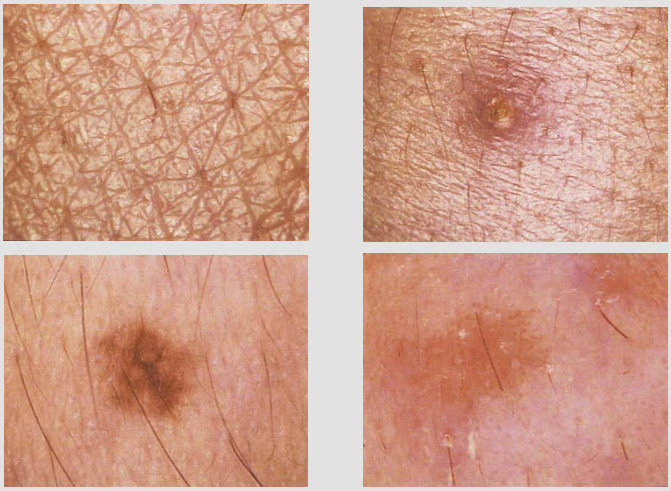
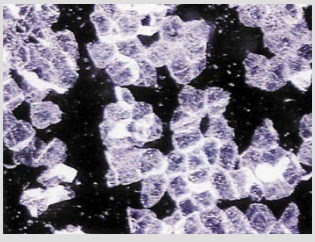
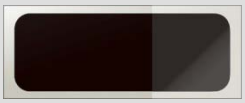
Lenses for i-Scope – Common Skin Applications

With a strong expertise in optics, our quality is unparalleled and options are unlimited.
Contact us for new, unique requirements.

Application	Description	Image (left to right, top to bottom)
Low magnification: **Skin texture** and **pigmentation** analysis using the MORITEX "TPL" method at 30x  30xPL	1. Ideal normal skin, fine texture, clear appearance 2. Sun damaged skin, texture roughened, lined appearance 3. Sensitive skin, dry with visible capillaries 4. Pigment spot	
Low magnification: **Skin texture** and **pigmentation** analysis using the MORITEX "TPL" method at 50x  50x PL	1. Ideal, normal skin, fine texture and appearance 2. Pore with accumulated sebum 3. Pigment spot 4. Dry, flaking skin and thin corneal layer	
High magnification: Indirect inspection of **cell turnover** or skin flakiness/keratin/ squames at 700x  700x	1. Enlarged keratin removed from skin with keratin tape 2. Keratin tape to remove dead cells from corneal layer	 

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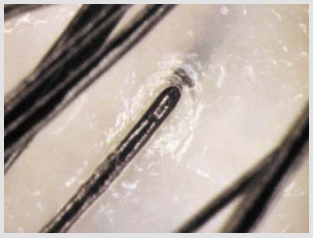
Application	Description	Image (left to right, top to bottom)
Mid-level magnification: **Hair and scalp** analysis  **120x**	1. Normal scalp with fine pores 2. Oily scalp with high amount of sebum 3. Normal hair 4. Damaged hair	   
Mid-level magnification: **Hair and scalp** analysis  **200x**	1. Healthy scalp, normal sebum production 2. Oily scalp with clogged pores 3. Damaged hair, split cuticles and ends 4. Visible capillary vessels	   
High magnification: Detailed inspection of the **cuticle**  **700x**	1. Smooth cuticle 2. Rough cuticle	 

All technical data are subject to change without further notice.

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