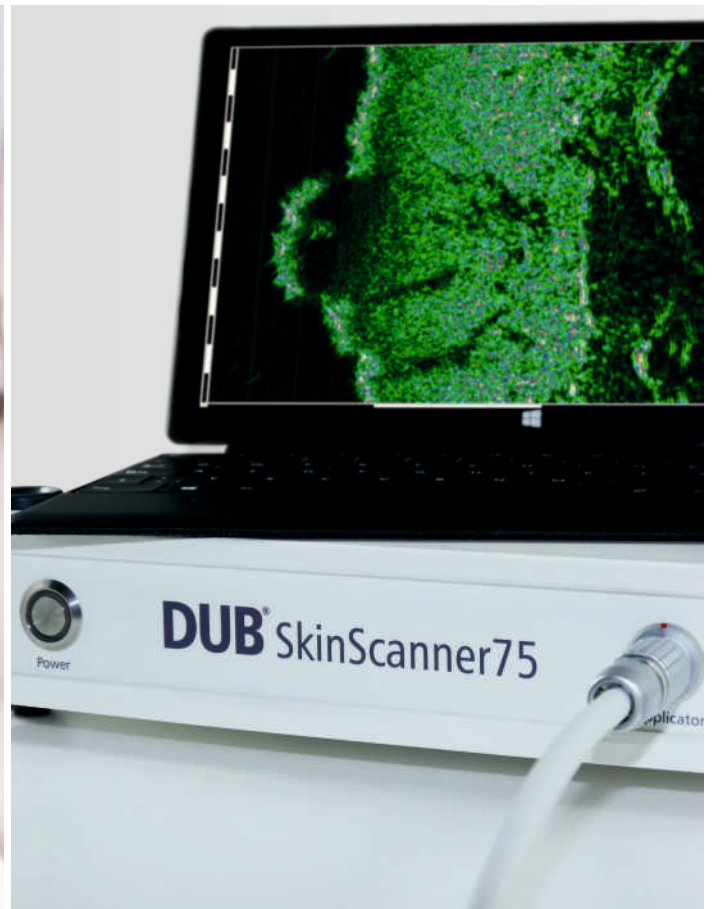


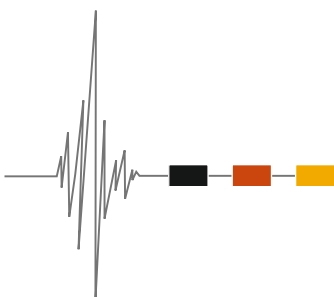
# DUB<sup>®</sup> SkinScanner

## Skin Measurement with Ultrasound

www.dubskinscanner.com



Dermatology • Aesthetics • Research • Cosmetics



## tpm taberna pro medicum GmbH

### ■ High Frequency & High Resolution Ultrasound of the Skin

The DUB®SkinScanner systems are high frequency and high resolution diagnostic ultrasound systems for use in dermatology, aesthetics and pharmaceutical and clinical research. Different models, versions, frequency ranges and options are available for all requirements. Today the 22 MHz diagnostic ultrasound is a wide spread method for non-invasive skin analysis.

### ■ History

After 10 years of broad experience in medical ultrasonography, including an intensive research and development program, tpm was proud to introduce the first commercially available A/B digital ultrasound system - our DUB®20 in 1986 designed especially for dermatology and cosmetic use with 20 MHz.

The finest resolution and superior quality of signal processing and image analysis are pre-eminent for the DUB® systems. The DUB® provides continuous and rapid high resolution ultrasonography to exacting scientists. After introducing the Windows version in 2001 the wide range of measurement functions of the DUB® software has been enlarged. From then on with the Windows operating system the DUB® for Windows software was much easier to operate.

### ■ Today

Our product portfolio offers frequencies from 18 MHz to 100 MHz mostly covered by portable DUB®USB devices. This broad range of devices provides an resolution (axial) from 88 µm to 16 µm.

**2004** the first DUB® as a USB version was introduced: the DUB®-USB. From then on it was possible to attach a high frequency high resolution ultrasound imaging system to an existing PC, controlled by the DUB® for Windows software.

In **2007** the DUB®-USB75 has come into our product line, which extends the USB systems to frequency range from 18 MHz to 75 MHz. In the same year the very high frequency system with 100 MHz was introduced. One year later, in **2008**, the optional Vacu Elasto Pump for USB systems was introduced.

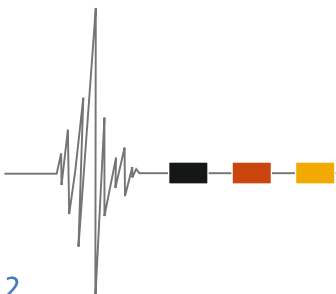
In **2012** the DUB®cutis was presented as cost-effective entry-level solution with 22 MHz.

One year later, in **2013**, the DUB®SkinScanner software was already compatible with modern touch screen computers and tablets.

Introducing the DUB® SkinScanner software version 5 in **2015** with a complete new design und many new and improved functions it is now also compatible with almost all Microsoft Windows operating systems from Windows 7 up to Windows 10 with 32 and 64 Bit.



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# DUB<sup>®</sup> cutis

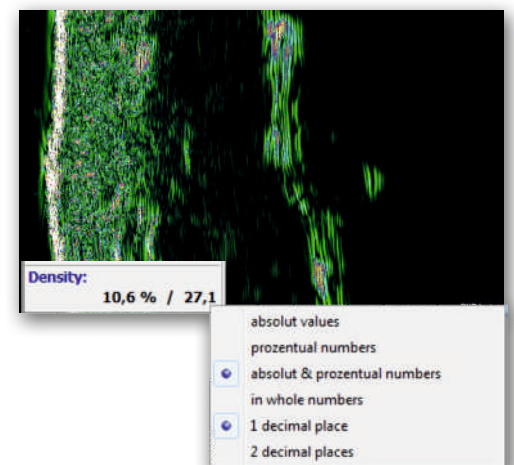
## The starting level in high frequency ultrasound imaging systems

### with 22-28 MHz linear B-Scan applicator

A cost-effective device ideal for practicing doctors. The DUB<sup>®</sup> cutis fulfills all requirements for German health insurance.

#### ■ Key features

- Max. axial resolution: 57  $\mu$ m at 28 MHz
- Max. digitizing depth: 8 mm
- Scan width: 12.8 mm linear (33  $\mu$ m step width)
- Medical CE and FDA 510K
- Connection: USB 2.0 or USB 3.0
- DUB SkinScanner software compatible with Windows operating systems version 7, 8.1 and 10 (32/64)
- Viewing modes: B-Scan, A-Scan, Sum-A, ScanLoop (20)
- 2 color scales
- Measurement: length, area, density, width, depth
- Automatic skin thickness
- Automatic skin density
- Personalizable: e.g. clinic or doctor's name



#### Technical Specifications - Main Unit

Dimensions	125 x 185 x 74 mm
Weight	0.8 kg
Power supply	90 - 264 V AC
Sampling rate	100 MHz
Lateral step width	33 $\mu$ m
PC connection	USB 2.0/3.0 High Speed

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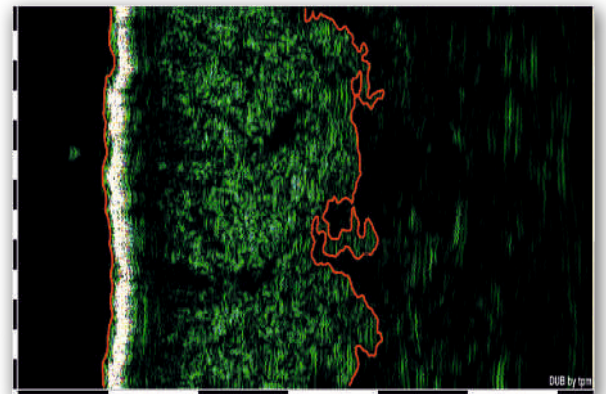
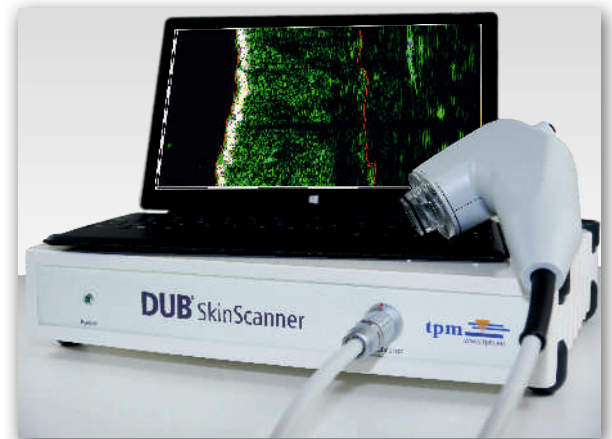
# DUB<sup>®</sup> SkinScanner

The standard system in high frequency ultrasound imaging systems  
for 22-28 or 33-38 MHz linear B-Scan applicators

The standard device for more flexibility.

## ■ Key features

- Max. axial resolution: 42 µm at 38 Mhz
- Max. digitizing depth: 16 mm
- Scan width: 12.8 mm linear (33 µm step width)
- Medical CE and FDA 510K
- Connection: USB 2.0 or USB 3.0
- DUB SkinScanner software compatible with Windows operating systems version 7, 8.1 and 10 (32/64)
- Viewing modes: B-Scan, RF-Mode, A-Scan, Sum-A, ScanLoop (2000)
- Filter: Hilbert transformation
- 7 color scales
- Measurement: length, area, density, width, depth, ROI, rectangular measuring field
- Automatic skin thickness
- Automatic skin density
- Personalizable: e.g. clinic or doctor's name



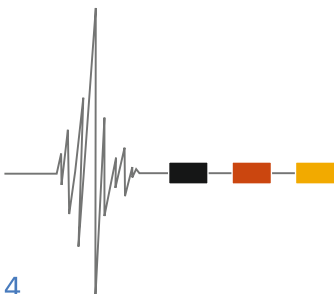
## ■ Available applicators

- Linear B-Scan 22-28 MHz  
Max. penetration / axial resolution: 10 mm / 57 µm
- Linear B-Scan 33-38 MHz  
Max. penetration / axial resolution: 6 mm / 42 µm

### Technical Specifications - Main Unit

Dimensions	330 x 270 x 70 mm
Weight	3.9 kg
Power supply	100 - 240 V AC
Sampling rate	100 MHz
Lateral step width	33 µm
PC connection	USB 2.0/3.0 High Speed

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# DUB<sup>®</sup> SkinScanner75

## Multiple high frequencies with one ultrasound imaging system

for all available linear B-Scan applicators up to 75 MHz

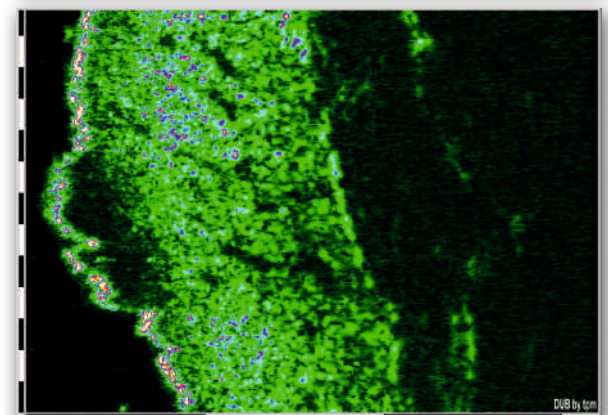
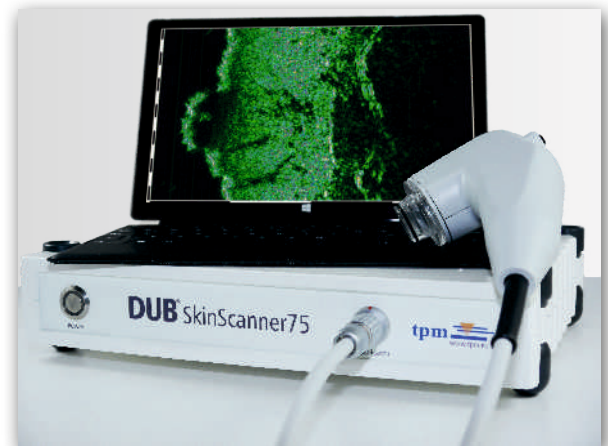
The premium device for the finest resolution.

### ■ Key features

- Max. axial resolution: 21  $\mu\text{m}$  at 75 Mhz
- Max. digitizing depth: 16 mm
- Scan width: 12.8 mm linear (33  $\mu\text{m}$  step width)
- Medical CE and FDA 510K
- Connection: USB 2.0 or USB 3.0
- DUB SkinScanner software compatible with Windows operating systems version 7, 8.1 and 10 (32/64)
- Viewing modes: B-Scan, RF-Mode, A-Scan, Sum-A, ScanLoop (2000)
- Filter: Hilbert transformation
- 7 color scales
- Measurement: length, area, density, width, depth, ROI, rectangular measuring field
- Automatic skin thickness
- Automatic epidermis thickness (50 MHz and more)
- Automatic skin density
- Personalizable: e.g. clinic or doctor's name

### ■ Available applicators

- Linear B-Scan 18-22 MHz  
Max. penetration / axial resolution: 15 mm / 72  $\mu\text{m}$
- Linear B-Scan 22-28 MHz  
Max. penetration / axial resolution: 10 mm / 57  $\mu\text{m}$
- Linear B-Scan 33-38 MHz  
Max. penetration / axial resolution: 6 mm / 42  $\mu\text{m}$
- Linear B-Scan 50 MHz  
Max. penetration / axial resolution: 4 mm / 31  $\mu\text{m}$
- Linear B-Scan 75 MHz  
Max. penetration / axial resolution: 3 mm / 21  $\mu\text{m}$

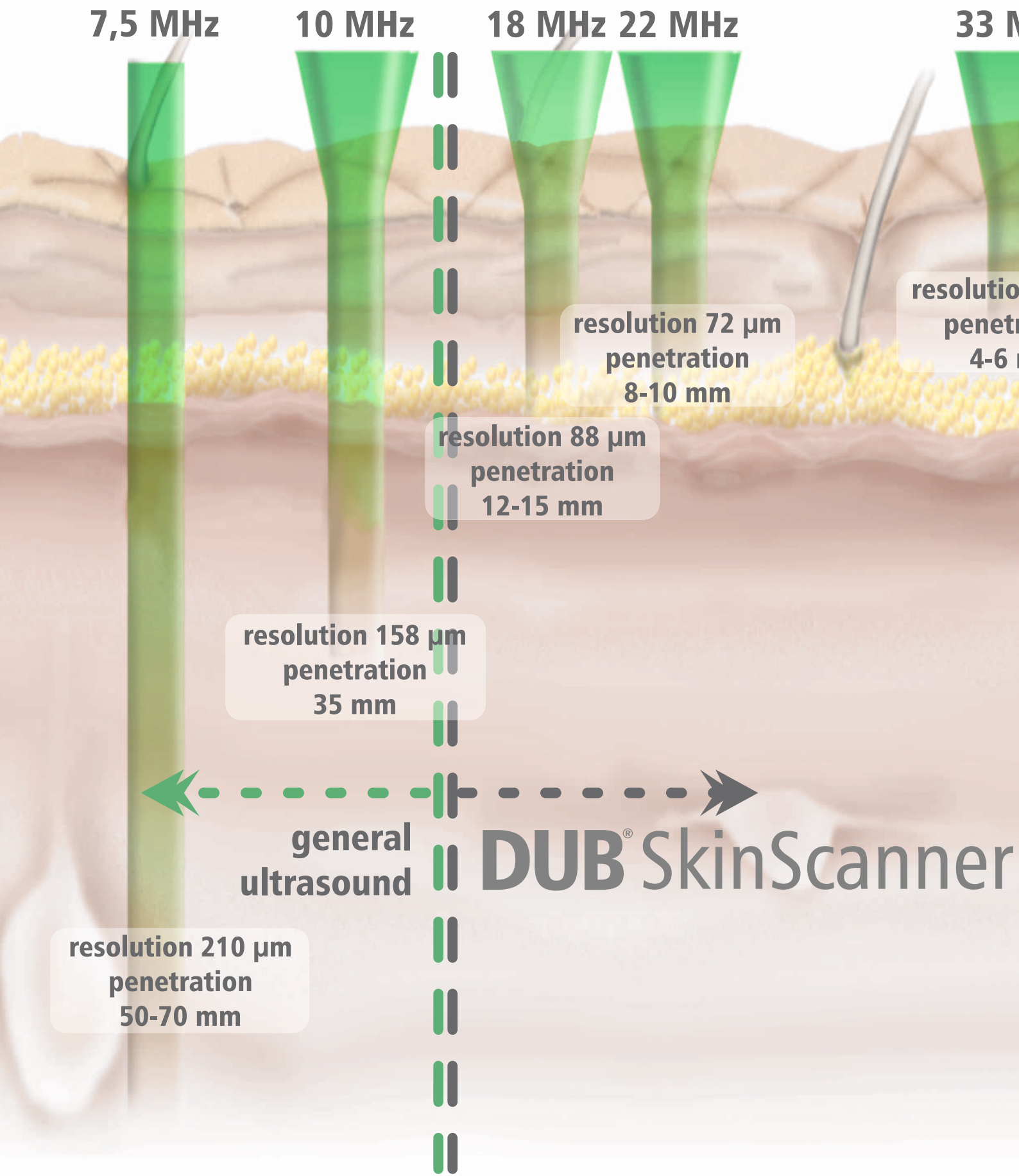


### Technical Specifications - Main Unit

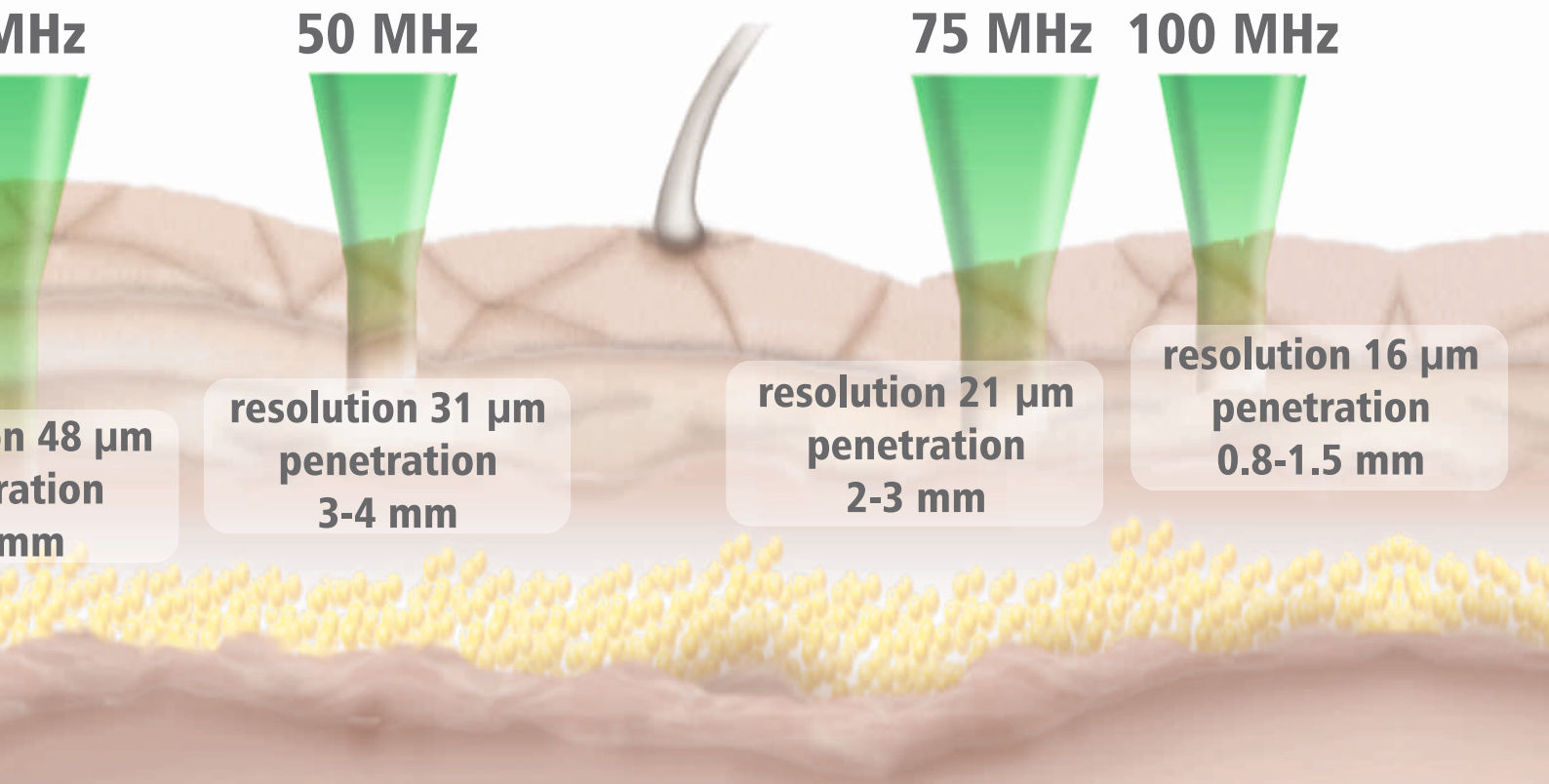
Dimensions	330 x 270 x 70 mm
Weight	3.9 kg
Power supply	100 - 240 V AC
Sampling rate	250 MHz
Lateral step width	33 $\mu\text{m}$
PC connection	USB 2.0/3.0 High Speed

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# Why we use different



# erent frequencies



The shown frequencies are the center frequencies - the upper border frequencies are up to 40 % higher.

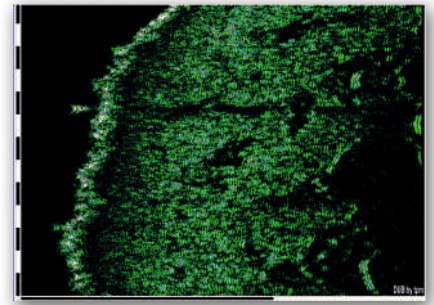
## DUB<sup>®</sup> 100 - 12 Bit

### The exceptional solution for very high frequency ultrasound

#### for 75 or 100 MHz applicators

The world-wide one-and-only 100 MHz system!

Please contact us for further information.



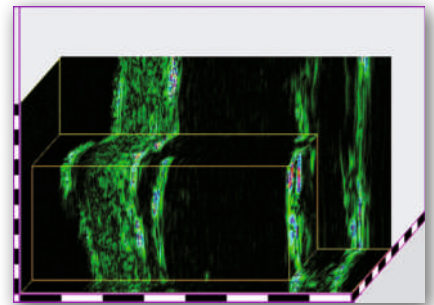
## DUB<sup>®</sup> profi D4W-3D

### The solution for real 3D ultrasound skin diagnostics

#### for 22, 33, 50 or 75 MHz 3D-applicators

The best choice for 3D ultrasound skin scanners.

Please contact us for further information.



## Options for DUB systems

#### ■ Volume measurement X-Scan

Easy-to-handle with two cross-sectional B-Scans with special applicator tip and additional software module.

#### ■ Polarizing Digital Dermatoscope

USB dermatoscope for reproducibility of ultrasound scans e.g. before, during and after treatment.

#### ■ Vacu Elasto Pump

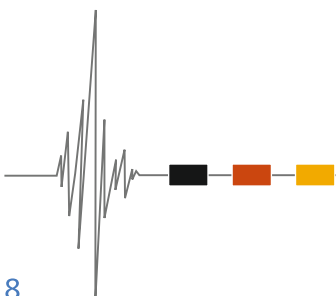
Skin elasticity measurement with the Vacu Elasto Pump system offers more detailed information about all skin layers and below. With adjustable pressure and runtime performance.



Vacu Elasto Pump



Digital Dermatoscope



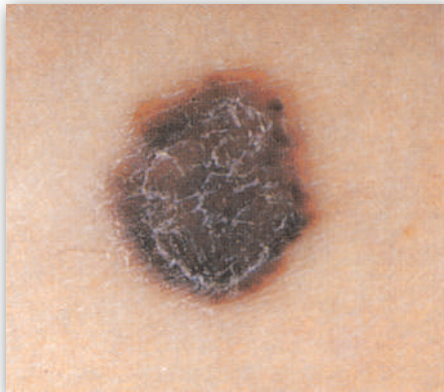


# Dermatopathology and Sonography

Poorly circumscribed, reddish-brownish tumor on the left leg

Diameter: 10 mm

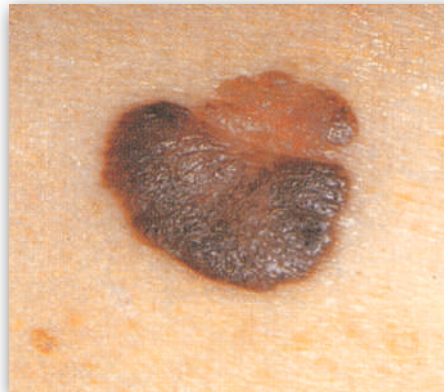
Tentative diagnosis: Malignant melanoma



Poorly circumscribed, asymmetrical, pigmented tumor on the upper back

Diameter: 10 mm

Tentative diagnosis: Malignant melanoma

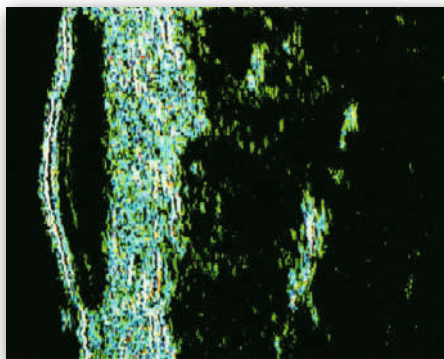


Epiluminescence picture of a tumor

Echolucent area with small echogenic band in the upper part and hypoechoic sharp edged area

Dermis and subcutis: Normal echogenicity

Tumor depth: 0.90 mm

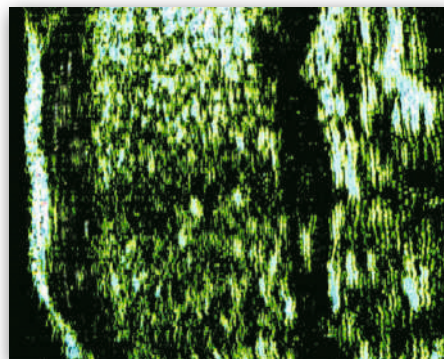


22 MHz-Sonogram with DUB SkinScanner

Echolucent area with several tissue echos within the whole structure of the poorly differentiated tumor

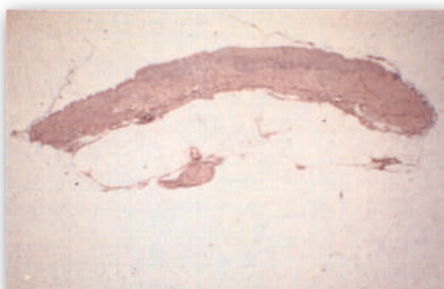
Dermis and subcutis: Normal echogenicity

Tumor depth: 1.0 mm



Final diagnosis: Malignant melanoma

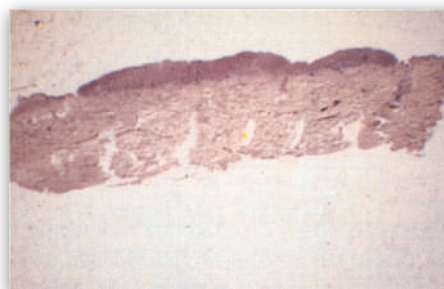
Tumor depth: 0.86 mm



Histology of surgically removed tumor

Final diagnosis: Hidrakanthoma simplex

Tumor depth: 0.95 mm



## Fields of application

### ■ Monitoring

- skin aging
- Mohs surgery
- skin elasticity
- skin treatment

### ■ Diagnosis

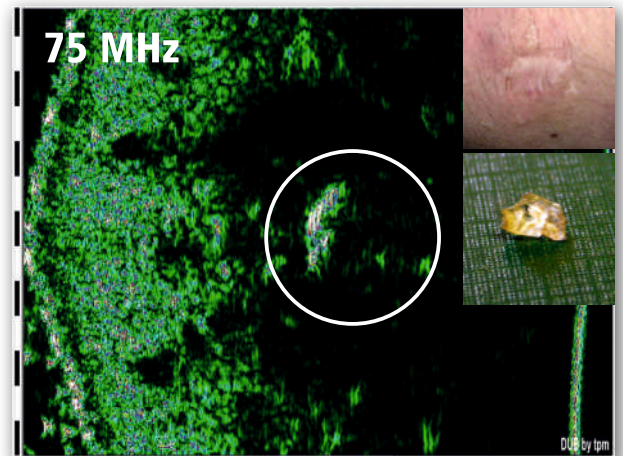
- tissue beneath wounds and skin
- skin damage caused by sun exposure
- skin lesions caused by different clinical reasons

### ■ Efficacy

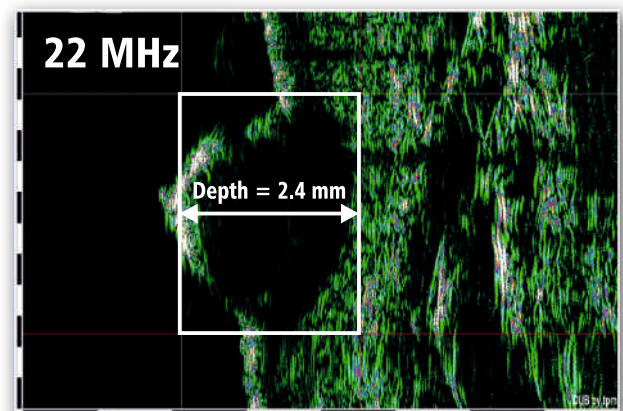
- laser treatment
- wound treatment
- cosmetic research
- aesthetic skin treatment

### ■ Detection

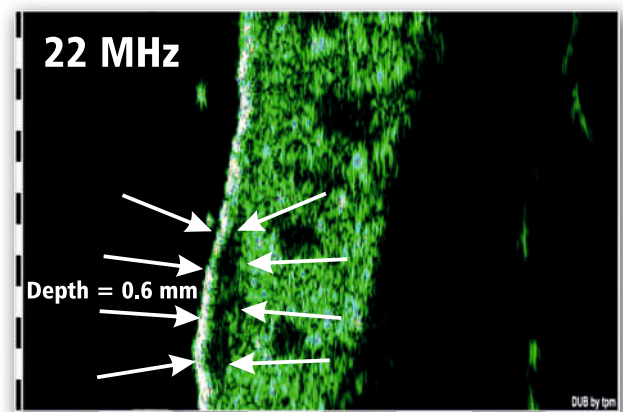
- skin thickness
- osteoporosis risk
- tumor depth before and after surgery



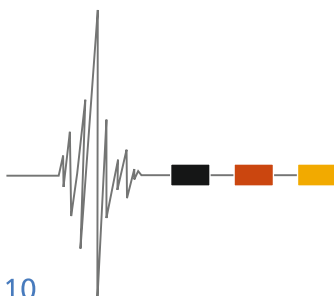
Foreign body in scar tissue



Nodular basal cell carcinoma



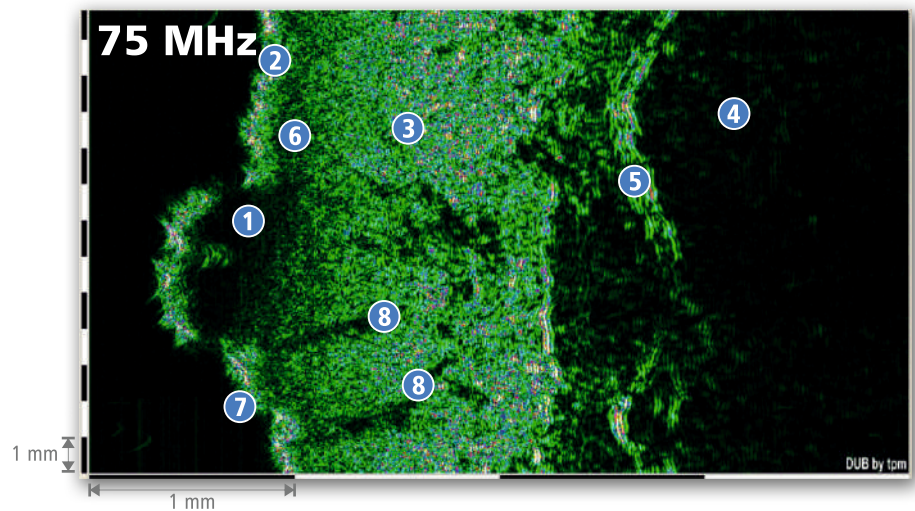
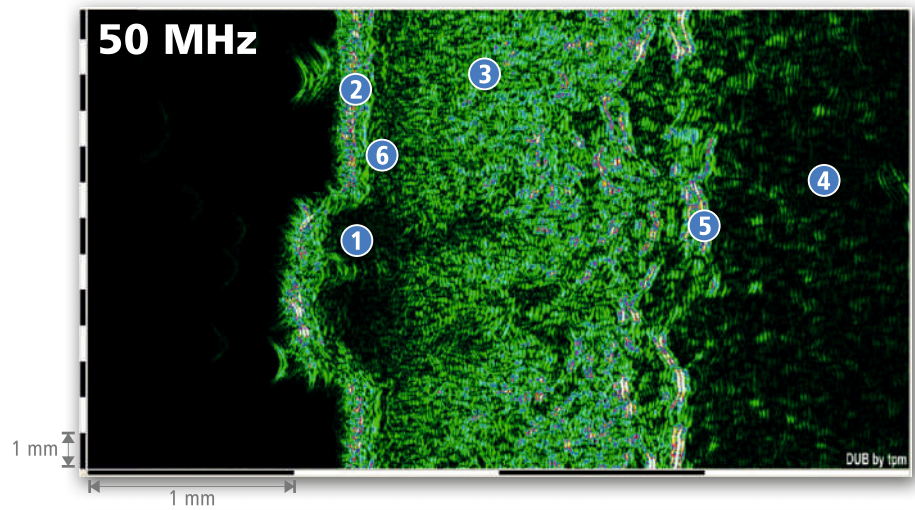
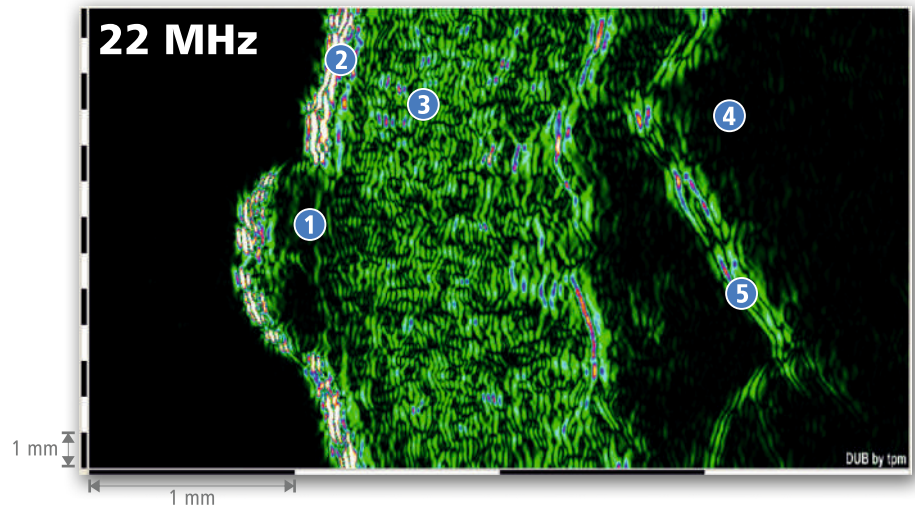
Superficial basal cell carcinoma





## Different frequencies - different resolutions

- 1 Naevus
- 2 Epidermis
- 3 Dermis
- 4 Subcutaneous Fat
- 5 Subcutaneous Tissue
- 6 Sun Damage
- 7 Stratum Corneum
- 8 Hair Follicles



## Scan viewing modes

### ■ A-Scan

A complete ultrasound picture is assembled together out of many single A-Scan lines. With the DUB®SkinScanner software it is possible to view all single A-lines. Together with the Sum-A functionality the skin thickness can easily be measured.

### ■ B-Scan

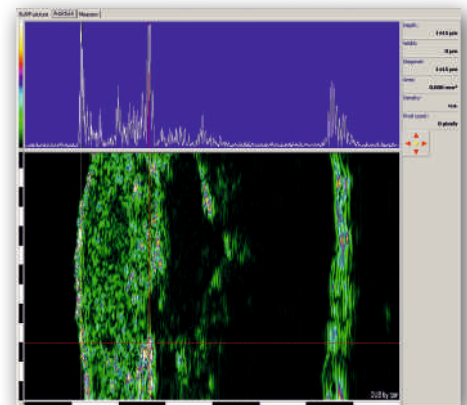
A complete B-Scan is built up from 384/768 A-Scan lines. Converted into one of 7 available color scales and 2 different transformations (Hilbert and Full-Wave) a typical high frequency ultrasound image for clinical evaluation is created.

### ■ RF-Scan

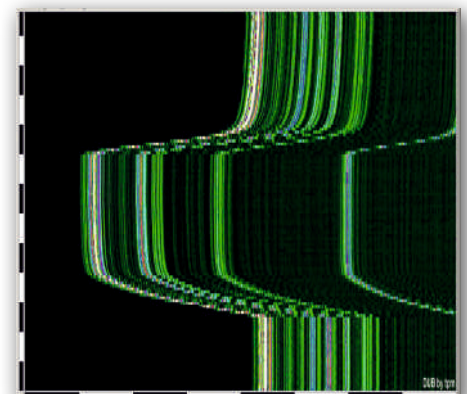
The RF-Scan shows the original raw data of the recorded ultrasound image. All calculations and different viewings will always be calculated by the DUB®SkinScanner software with this data format to ensure highest picture quality.

### ■ M-Scan

The M-Scan shows a single A-Scan line against the time. These pictures are mainly used for skin elasticity measurement in combination with the Vacu Elasto Pump. Pressure and timings are adjustable as well as the possibility to switch between spontaneous- and rising-mode.



A-Scan (top) B-Scan (below)



M-Scan