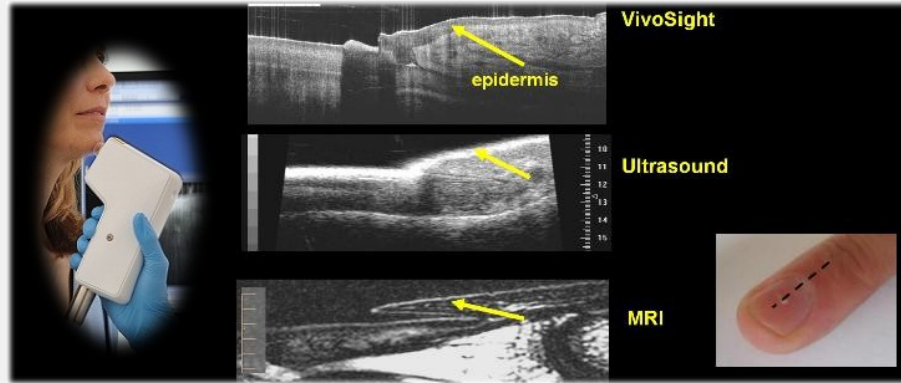


► **Case Study**

<i>Application</i>	<i>Medical</i>
<i>Product</i>	<i>M2i.4022-exp Digitizer 4 Channel 20 MS/s 14 Bit</i>

OCT application for skin cancer diagnosis

The VivoSight® OCT scanner uses the technique of swept-source Optical Coherence Tomography (SS-OCT) for cross-sectional imaging of skin. This is a significant new tool to assist in diagnosis and treatment of skin cancers and other skin conditions. The images are similar to ultrasound, but using infra-red light gives much higher resolution (better than 10 μm) at the expense of penetration (limited to 2 mm). The clinician uses a hand-held probe on an umbilical to scan the patient.



Who is the customer?

Michelson Diagnostics are a UK-based independent company developing and marketing highly innovative products based on a unique optical imaging technology. Michelson Diagnostics has a lot of combined experience of developing, marketing and supporting high technology products. Management is advised by some leading figures from the world of cancer research.

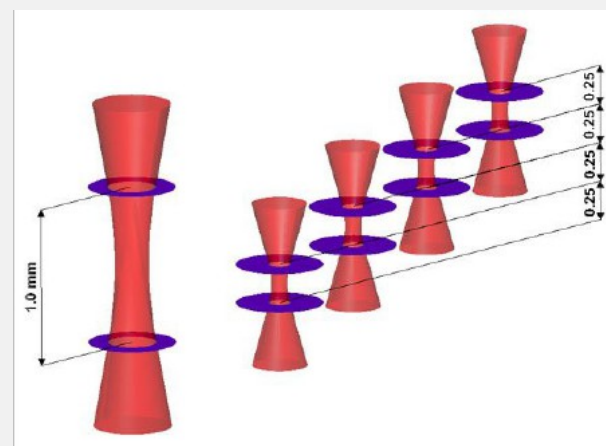
Application Details

The VivoSight® OCT scanner is an advanced laser based imaging technology that produces high definition images of the skin up to a depth of 2 mm. The system has been developed specifically to help dermatologists diagnose and treat a range of commonly occurring skin cancers and other conditions. The images help identify diagnostically important features without the need for a biopsy.

Each sweep of the laser is used to probe a single line into the skin. Light is scattered back from different depths within the tissue depending on variation of refractive index. The collected light is combined with a reference beam in an interferometer and the result is detected and digitized.

The OCT system realized in this application uses four interferometer channels simultaneously to increase depth of focus and improve contrast, each beam coming to a narrower focus than a single beam, (hence the use of a four-channel digitizer).

For low latency, so the displayed image keeps up with the user's hand movement, raw data for each frame is read out and processed in parallel with its capture.



OCT system using 4 interferometer channels to increase depth of focus and improve contrast

► Case Study

Requirements

- 4 synchronous A/D channels with high resolution
- Sampling rate between 13 MS/s and 17 MS/s
- Fast repetition rate (Multiple Recording)
- Continuous data stream to PC (FIFO mode)
- Programming in C# in .NET environment

Solution

After several tests Michelson decided for the M2i.4022-exp with 4 channels 14 bit resolution 20 MS/s due to the cost effective and slim design (4 channels with one slot width) and the good noise performance.

The Spectrum card has been installed in a standard desktop PC, combined with laser interferometer, detector and associated power supply. All modules are placed on a trolley with a TFT screen fixed at the top allowing the operator to easily see the scanned images during patient examinations.

A number of Vivosight systems has been built with this card.



The VivoSight® OCT scanner system